

September, 1986

Volume 5, Number 9

\$2.00

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MONITORING TIMES

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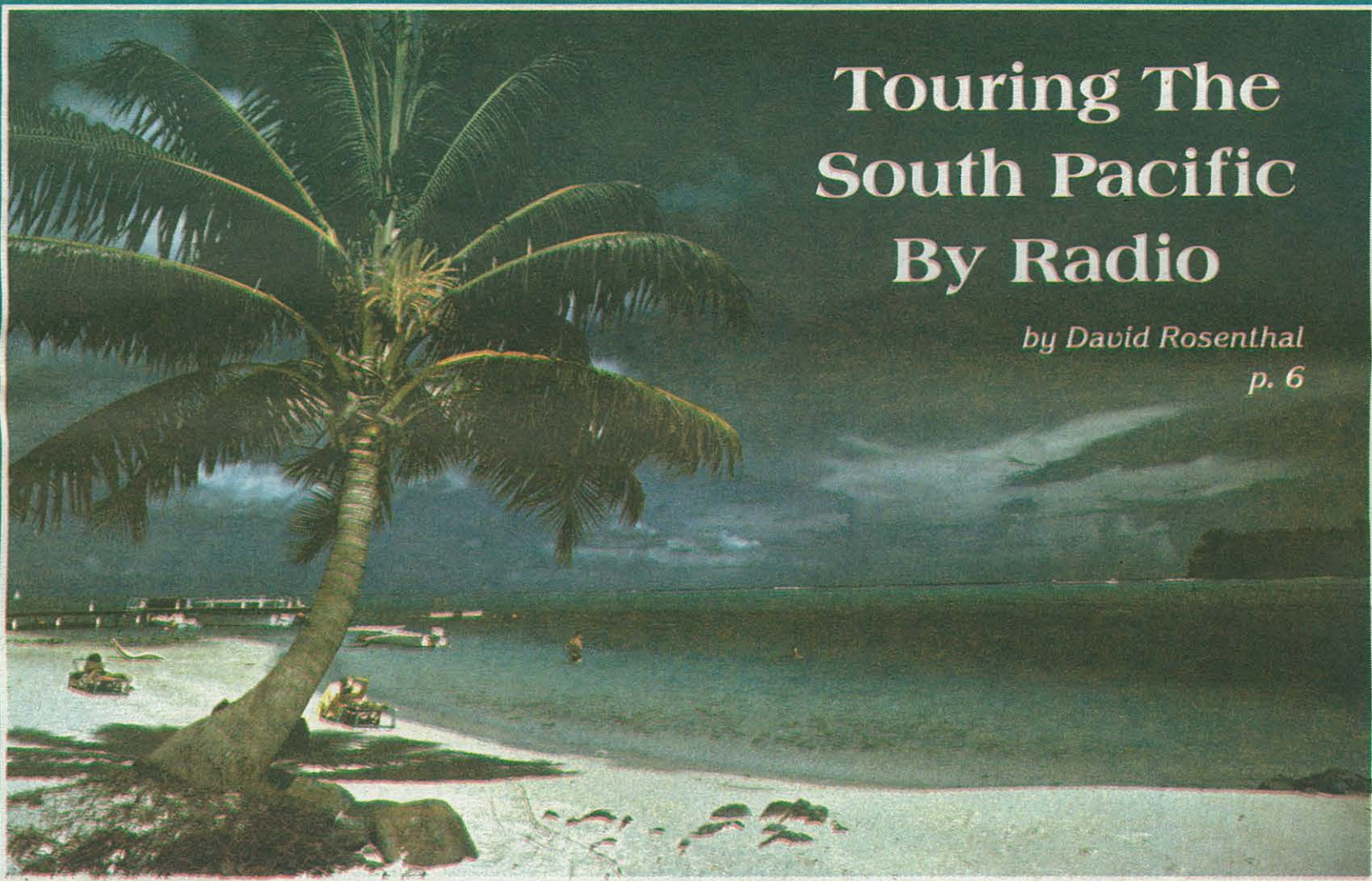
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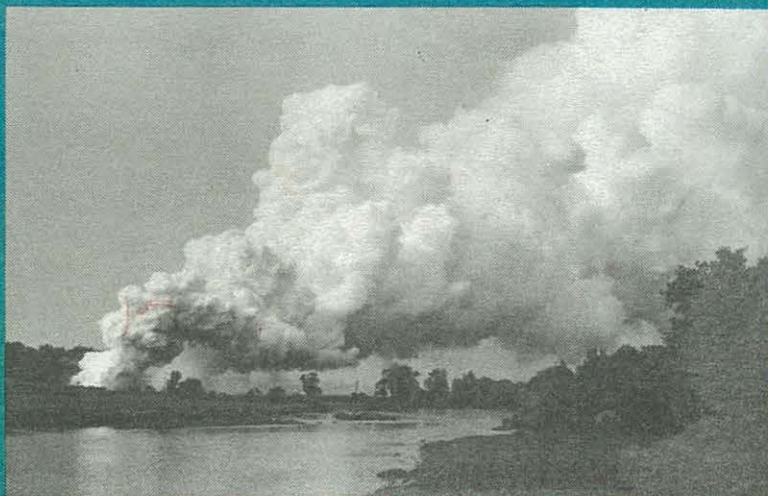


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NOW HEAR THIS



TEN-TEC'S NEW RX-325 SHORT WAVE RECEIVER

TEN-TEC, America's premier producer of high quality amateur radio equipment, now brings the ultimate in design to short wave listening.

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Audio output is 2 watts at 10% distortion.

Striking high-tech appearance finished in black.

Durable, high quality epoxy-glass circuit boards.

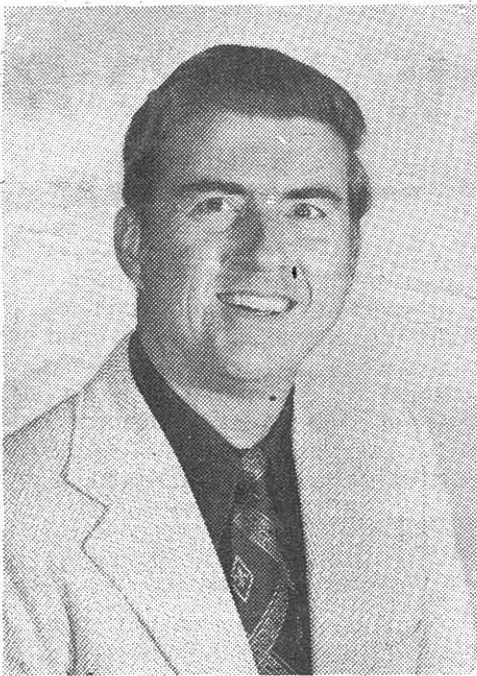
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MT's Larry Miller to Tour China as Guest of Radio Beijing

Monitoring Times is proud to announce that Broadcast Editor Larry Miller has been invited by the staff of Radio Beijing to visit the People's Republic of China. This is a great honor and a most generous offer by the station. For two weeks in October, Miller will visit Radio Beijing and tour several Chinese cities including Shanghai, Suzhou and Xian.

Larry invites the readers of *Monitoring Times* to "come along" on the trip by sending him

questions that they would like to ask the staff of Radio Beijing. When he returns, we'll publish your questions and the answers in *MT*. Take advantage of this unique opportunity to have your own personal representative in Beijing. Send your questions or comments to Larry at P.O. Box 691, Thorndale, PA 19372 USA.

And be sure to look for the first in a series of historic, first-hand reports on broadcasting in China, direct from the capital city of the world's 3rd largest country.

Soviet Monitoring in the U.S.--

Where are our priorities?

Many Americans, recently made aware of concerns for communications privacy by the bill presently in front of the Senate, are unaware that our government has delivered prime monitoring sites to the Soviet spies now resident in this country.

In spite of vigorous protests by the National Security Agency (NSA), Central Intelligence Agency (CIA) and the Federal Bureau of Investigation (FBI), 350-foot-high Mount Alto in Washington, D.C., was turned over to the Soviets for their construction of an elaborate radio interception installation aimed at the White House and other prime sensitive targets in the nation's capitol.

Another question of mental competence arose when high ground was given to the Soviets for a similar facility erected as a 19-story building in Riverdale (The Bronx), New York.

Soon the United States Senate will be voting on (and undoubtedly passing) the so-called "Communications Privacy Act of 1986," curbing the rights of Americans to use their scanners for recreational monitoring on certain frequencies declared inherently private.

In the meantime, the Soviet technicians, immune to prosecution, will continue unabated their elaborate program of electronic intrusion into every aspect of private communication within the scope of their listening interests.

Bob Grove

Bob Grove
Utilities Editor

"Scanner Bill" Update:

The Eleventh Hour

The Communications Privacy Act of 1986 is rapidly on its way to consideration by the whole Senate. Legislators claim they have heard virtually nothing from their constituents opposing the restrictions on the right to listen to scanners.

ACTION ALERT!

Your Help is Needed Now!

Robert Horvitz
Government Affairs Liaison



Your right to monitor the radio spectrum will be jeopardized if S. 2575, the Electronic Communications Privacy Act of 1986, is passed into law. S. 2575 would criminalize the reception of many common radio signals. The bill has already passed the House of Representatives and it is now on a "FAST TRACK" in the U.S. Senate. But the rules of the Senate are such that EVEN A SINGLE SENATOR OPPOSED TO THE BILL COULD POTENTIALLY DERAIL IT.

ANARC has called for hearings to discuss the radio provisions of the bill and to examine alternatives. We've circulated a list of amendments that would alleviate most of our concerns. We support the general goal of the bill, but believe that privacy of wireless communications can best be assured through technology, not by making criminals out of law-abiding radio users.

Senate staffers acknowledge that our amendments have merit, and hearings might be useful, but they're not convinced that many people share our concerns. This is a

political process, and SENATORS ARE NOT GETTING MUCH MAIL PROTESTING THE BILL'S TREATMENT OF RADIO.

YOUR SENATOR MUST HEAR FROM YOU

THIS IS OUR LAST CHANCE. If we don't show there is public opposition to the radio portions of S. 2575, the bill will probably become law by the end of the year.

CALL, TELEGRAPH, OR SEND A MAILGRAM to your Senator and the Members of the Senate Judiciary and Commerce Committees as soon as you get this. Express your views. Ask for hearings and more time to assess the bill's consequences. Say whatever you think. But SAY IT NOW!

Otherwise, you could soon be exposed to federal criminal and civil liabilities merely by using a scanner.

(Please turn to page 55 for a sample letter and address list for your Senators)

MONITORING TIMES

Published by:

Grove Enterprises, Inc.

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Advertising and Dealerships

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Cover art by Owassa Graphics, Murphy, NC.
Color photo by David Rosenthal.

MONITORING TIMES (ISSN 0889-5341) is published monthly for \$14 per year by Grove Enterprises, Inc., P.O. Box 98, Brasstown, NC 28902 (ph.1-704-837-9200). Second class postage paid at Brasstown, NC, and additional mailing offices. POSTMASTER: Send address changes to MONITORING TIMES, P.O. BOX 98, BRASSTOWN, NC 28902.



Australia

Changes at Radio Australia: The 0530 UTC edition of the DX show *Talkback* on Sundays has been shifted to 0710 UTC. *Music of RA* will be played in *Talkback's* old slot.

Three programs at .RA have been canned: *Bill Belcher's Band Bazaar*, *Waving Our Words and Music*, *Discover Australia* and *Profile*. Try instead for:

Jazz Australia -- Australian Jazz: Wednesdays at 2230 UTC; Thursdays at 1530 UTC and Saturdays at 0530 UTC.

Aboriginal Australia Today -- An insight into Aboriginal culture, music, arts and heritage and an examination of Aboriginal aspirations in the '80s.

Tiam Bilong Masta -- The memories and experiences of people who lived and worked in Papua New Guinea, which was administered by Australia for many years, in the decades before independence ten years ago. Hosted by Tim Bowden: Sundays at 1530 and 2230 UTC, Mondays at 1730 UTC, Tuesdays at 1240 UTC and Thursday at 0730 UTC.

Down Under Abroad -- An appraisal of the international aid and assistance programs of Australian governments, examining the objectives and outcomes of projects around the world. Presented by Harry Martin: Sundays at 0110 and 1610 UTC, Wednesdays at 0610 and 1210 UTC, Fridays at 0310 and Saturdays at 2110 UTC.

Belgium

Belgian Radio can be heard at 0030 UTC with repeat broadcasts at 0800 and 1300 UTC. The program schedule is as follows: all programs begin with *Belgium Today*. Other programs include *Belgian Politics*, *Sports Report* and *Regional Cooking* on Mondays, *North-South*, P.O. Box 26 and *Belgium through the Ages* on Tuesdays, *Radio World*, *Stamps/ QSLs* and *Touring Flanders* on Wednesdays, *Around the Arts*, *Sciences/Foreign Trade/Living in Belgium* and *Historic Gallery* on Thursdays, and *Industry* and *Technology*, *Periscope* and *Press Cuttings* on Fridays.

Bermuda

DeFontes Broadcasting Co., Ltd. has launched a new radio station (VSB 1160) geared solely to the Bermuda visitor. The station programs a magazine format, featuring general facts about Bermuda, music by local

artists, coverage of island activities and interviews with local personalities. VSB 1160 broadcasts seven days a week from 7:00 am until noon on 1160 kHz.

Bhutan

According to Radio Netherlands Media Network, your chances of hearing the elusive Radio NYAB from Bhutan's Division of the Ministry of Communications and Tourism has just increased. In addition to the existing 400 watt transmitter (which explains the use of the word, "elusive"), the station has added a 5000 watt American-made unit to its line up. Try for Bhutan Mondays through Saturdays between 1100 and 1400 UTC on 6035 kHz in parallel with the old 400 watt unit on 3395 kHz. On Sundays try 6035 kHz between 0600 and 0900 UTC.

Botswana

Good news for hard-core QSL hounds. After 16 years, Radio Botswana has apparently begun to QSL reception reports -- if you provide return postage -- according to a station engineer. This began after someone notified the station that it was being heard on 6712 kHz after the heat of a hot Botswana day threw the station's frequency synthesizer into insanity. Gerry Dexter is now off the hook!

Budapest

Radio Budapest offers the following reports for your listening pleasure in September at 0100 and 0200 UTC:

September 4 -- Walk Abroad
September 5, 11 -- Cancer Progress
September 19, 25 -- Chess Prodigies

On *Sundays*, 0200 UTC only, you can hear *Buda Castle* (September 7); *Star Requests* (September 14); *Hungarian Versailles* (September 21) and *Irish Buskers* in Budapest (September 28).

Canada

The time for Radio Canada's *Shortwave Listeners' Digest* program with host Ian McFarland, has been changed from 0400 UTC on local Sunday evenings to 0000 on the same day. Don't ask RCI's Allan Familiant to confirm this, though. He'll tell you that the time hasn't changed, it's just more convenient.

CKZU, Vancouver's shortwave relay on 6160 kHz has applied for permission to increase its power from 500 watts to 1,000 watts. Reason: to better reach the British Columbia coast. World of Radio

China, People's Republic

The agreement between Radio France International and Radio Beijing whereby the two station's traded transmitter time is off. According to sources, when conservative French Prime Minister Jacques Shirack came to power recently, one of the first things he did was throw out the agreement. RFI is now looking into the possibility of building its own relay in Sri Lanka. Let's hope they have as much luck as the Germans did with theirs.

Cyprus

Bayrak Radio, in the Turkish Republic of Northern Cyprus, is now broadcasting 24 hours a day on 6160 kHz. This, according to Frans Vossen on Belgium's *Radio World*, replaces the old 6149 kHz.

Dominican Republic

Radio Antillas in the Dominican Republic has been active on 5955.5 kHz from 0945 UTC with talk by a male announcer. Like many Dominican shortwave stations, this one appears and disappears throughout the years.

Radio Discovery has reached an agreement with the owners of Radio Clarin in the Dominican republic to provide the station's shortwave service on 11700 with programming. Listen for a Radio Earth/Radio Discovery clone.

Meanwhile, Jeff White of Radio Discovery reports that the station has installed a new 1500 watt transmitter which replaces the 40 watt unit which replaces the 750 watt unit that blew up some months ago. Listen for it on a wildly variable schedule at 15045 during the day; 6025 during the evenings.

England

One of Britain's most respected journalists, John Tusa, takes over as head of the BBC External Services this month. Says Tusa, "International Broadcasting is on the verge of... further development. To some extent it has grown in an ad hoc way, with the broadcasters and the listeners finding one another in the remote corner of the ether, like people stumbling upon a friend in the pitch dark.

"It is not only that the need to know is more acute than ever before, but the capacity to transmit and to receive are becoming ever more powerful too. Satellites may be able to put in radio signals of greater strength and clarity, and galloping

over the horizon comes the heady prospect of television by satellite.... I do not pretend to know if, when or how we might launch such a service. But I do know that it is on the agenda and cannot be ignored."

Also not to be ignored is a highlight of the BBC's program offerings for September:

Drama

Simultaneous transmission by BBC World Service and Radio 4 UK of internationally renowned stage plays: George Bernard Shaw's *Pygmalion* (1st at 0030 UTC); *The Seagull* by Anton Chekhov (7th at 1330 & 8th at 0030); *All My Sons* by Arthur Miller (14th at 1330 & 15th at 0030); Luigi Pirandello's *Six Authors in Search of an Author* (21st at 1330 & 22nd at 0030) and *The Miser* by Moliere on the 28th at 1330 & 29th at 0030 UTC).

Features

Martyn Broughton traces the origins explosive spread and subsequent hold of nationalism world wide in three programs starting on the Sunday the 14th at 2330 with repeat on subsequent Mondays at 0630 and 1515 UTC. Keith Hindell looks at the over 100 inhabited offshore islands of Britain on a series of programs starting on Monday the 15th at 1615 with repeats the same day at 2315 and on Tuesdays at 014 and 0730 UTC. Elizabeth Burke says that what you wear says something about you -- whether it be pin leather and safety pins or pin strip suits. 7th at 1615 with repeats on the 9th at 1215 and 2330 UTC and the 11th at 0330 UTC. And The Doomsday book is celebrating its 900th anniversary in Britain. Miriam Newman looks at this document and the society that produced it. The first of two programs is broadcast on the 28th at 1615 UTC; the second on the 30th at 1215 UTC.

Music

The Beeb rocks out, circa 1970 with concerts by Genesis (14th 0100 UTC), Deep Purple (20th at 0100 UTC) Fleetwood Mac (27th at 0100 UTC) and the Jeff Beck Group (Oct 4 at 0100 UTC). For the most sophisticated listener of high quality classical music (on shortwave?) the BBC offers Mozart's Clarinet Quintet with Thea King on the 14th at 1515 UTC with repeats on the 16th at 2115 UTC. The Borodin Trio plays Schubert's Piano Trio No.1 in flat, D898 on the 21st at 1515 UTC with repeat on the 23rd at 2115 UTC and Schuman's Piano Quintet in flat, Op. 44, played by the Beaux Arts Trio and Friends on the 28th at 1515 UTC with a repeat on the 30th at 2115 UTC.

News

World News comes to you from the BBC daily at 0000, 0200, 0300, 0400, 0500, 0600, 0700, 0800, 0900, 1100, 1300, 1600, 1700, 1800, 2000, 2200 and 2300 UTC. *Radio Newsreel*, which presents news of events as they happen can be heard daily at 0015 UTC and *The World Today*, which thoroughly examines one topical aspect of the international scene can be heard Monday through Friday at 1645 and 2209 UTC, Tuesdays through Saturdays at 0315, 0545 and 0915 UTC.

France

Radio France International reports that it broadcast a total of 773.5 hours a week in French. This includes 133 hours to Africa, it's largest target and 161 to North America (next to last-largest target). It also notes that it has 80 million listeners, 33 transmitters and 400 employees in Paris, including 200 journalists. Fast Facts about France. Bonjour!

Internat'l Waters

Abbie Nathan's Voice of Peace, located on a ship, can now be heard on shortwave, according to Greg Shafritz. Look for the second harmonic of VOP on 3060 kHz. Shafritz says it's strong enough to be heard in North America.

Iraq

Radio Baghdad has been heard on the unannounced and unlisted frequency of 15120 kHz for its English broadcast from 2100 to 2300 UTC.

Ireland

Aside from the Sunday morning Irish pirate stations operating on the 48 meter band, shortwave listeners now apparently have a rare opportunity to tune in the Emerald Isle because of shoddy transmitter maintenance. From the east coast of Ireland not far from Dublin comes Radio Rainbow. Its schedule puts it on 6240 kHz between 0900 and about 1200 UTC. One transmitter that operates on 1116 kHz AM is now throwing off harmonic signals on 2232, 3348 and 4464 kHz. Try for them on the following frequencies and address your reception report to "Eddie the Engineer," c/o Boyneside Radio, 14 Mill Lane, Trinity St., Drogheda, Co. Meath, Ireland. RNMN.

Gabon

Try for Radio Japan's relay via Africa Numero Uno at 1500 UTC in English on 21700 kHz.

Guatemala

Listen for Radio Cultural, Guatemala on 3300 kHz at around 0500 UTC. Program usually consists of instrumental music until 0530 when news begins. The interference you'll hear is from a nearby utility station.

Israel

International Radio magazine columnist Greg Shafritz is currently

hosting Kol Israel's DX program. The show never sounded better. Regular host Ben Dalfen is on vacation. Perhaps Ben might consider extending his holiday for several years.

Kenya

Kenya is now broadcasting in English at 0200 on 6050 kHz, at 0630 on 7270 kHz and from 1400 to sign-off on 6100 kHz.

Lebanon

The Voice of Hope in southern Lebanon, has switched frequencies from 6215 kHz to 6280 on a full-time basis. VOH is owned by the same people who plan to put a new U.S. shortwave station on the air this fall - California-based High Adventure Ministries -- KVOH.

Nigeria

With the economy of Nigeria in a shambles, the country's shortwave service is slowly coming to a halt. The 300 and 500 kilowatt transmitters are now off the air due to a lack of spare parts and at least one transmitter, on 11770 to central and southern Africa, is broadcasting nothing but noise. Remember an article in International Radio magazine some months back called *Nigerian Shortwave: Catch it Before It's Gone?* It's almost gone.

Papua New Guinea

Radio North Solomons on 3325 kHz has a new transmitter in service and has repaired its antennas. This should improve reception of this rare one. Talkback

Peru

Look for Radio Atlantida at 1000 UTC on 4790.5 kHz in Spanish. Program contains folk music and IDs as "Aqui Radio Atlantida Iquitos. Juan Illa, Miami, Florida.

Sri Lanka

The Sri Lankan government has decided to move the site of the new VOA relay station to Puttalam, 75 miles north of the capital, Colombo. This will displace 20 families, whereas the previous site at Iranawila would have uprooted 200. Plans call for four 400 kW and three 250 kW transmitters. Construction apparently has not yet started, SCDX

South Africa

Radio RSA is putting out feelers and floating trial balloons about the possibility of moving its evening transmissions to North America to our early morning hours, around 7 to 10 eastern time. Meanwhile, 9685 kHz has replaced 5980 at 0200 UTC.

Attempts to reach the U.S. contact for the South African-based anti-Zimbabwean clandestine station Radio Truth (See *Monitoring Times*, August, 1986) have been unsuccessful. A window clerk at the Blair station of Silver Springs, MD says that the P.O. Box number for Mr.

Stanley Hatfield is not even available at that branch. Employees at another postal station in Silver Spring also claimed the addressee unknown. Further attempts to track down Mr. Hatfield will be pursued.

Tanzania

A report on Sweden Calling DXers has stated that Radio Tanzania recently received a 20 kw transmitter as a donation from a British firm. The Central Bank in Dar es Salam is also trying to purchase two additional transmitters, according to the report.

United States

Just what we need: another shortwave service. But here it goes anyhow. Sunsplash Radio International, the brainchild of one Daniel J. Miller, will go on the air this summer with a 2-hour program of Reggae music. No information on frequency is available but the station reports that it has been in contact with Radio Earth, Radio Milano and others to find a place to broadcast from.

Glenn Hauser has released issue #110 of his bulletin. Containing an in-print home slide show of his trip to the Caribbean including "traveler's tales...visit to Deutsche Welle's Antigua relay site" etc.

Zzzzzzz... Wake me when it's over.

The broadcasts of Radio Marti are inspiring some Cubans to head for America in makeshift rafts. According to an article in the *Toronto Globe and Mail*, encouraged by news stories of other adventurers, as well as weather and tidal reports on the best times to go, some Cubans are lashing together crude truck tire rafts and heading across the 145 kilometers of open, shark infested waters. Radio Marti news director Jay Malin shrugs off responsibility for the raft people, insisting that the station does not encourage "illegal immigration." Harold Sellers

WHRI's new listener mailbag program is aired Fridays at 1530 UTC (other dates and times may be scheduled). It incorporates a one-on-one approach to communications with Lester Sumrall reading letters from listeners around the world. So far, the station says it has heard from listeners in 77 nations.

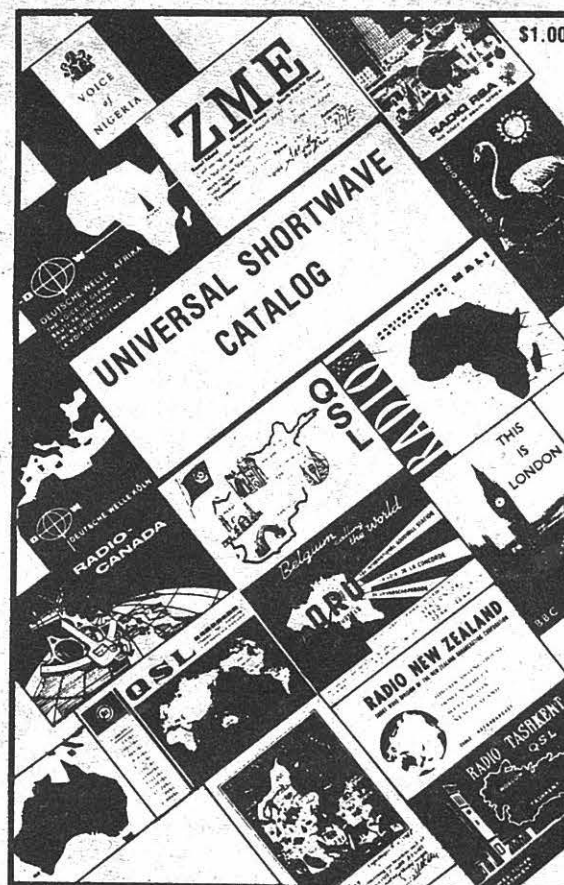
Yugoslavia

Yugoslavia is forging ahead with its seemingly interminable plan for a new shortwave installation. However, reports now have it that installation of four 500 kW transmitters has commenced and will be completed by the beginning of next year. Plans call for programs in ten languages. SCDX

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RADIO TAHITI

Touring the South Pacific by Radio

by Dave Rosenthal

For many of us, to think about Tahiti is to drift away. We float to a remote island paradise where the sound of distant surf blends smoothly with the sighs of the wind as it slips through the coconut palms. Huge clouds billow as they rise along the almost vertical jungle-clad mountainsides and there's nothing to do but watch yet another fantastic Polynesian sunset developing in this world outside of time.

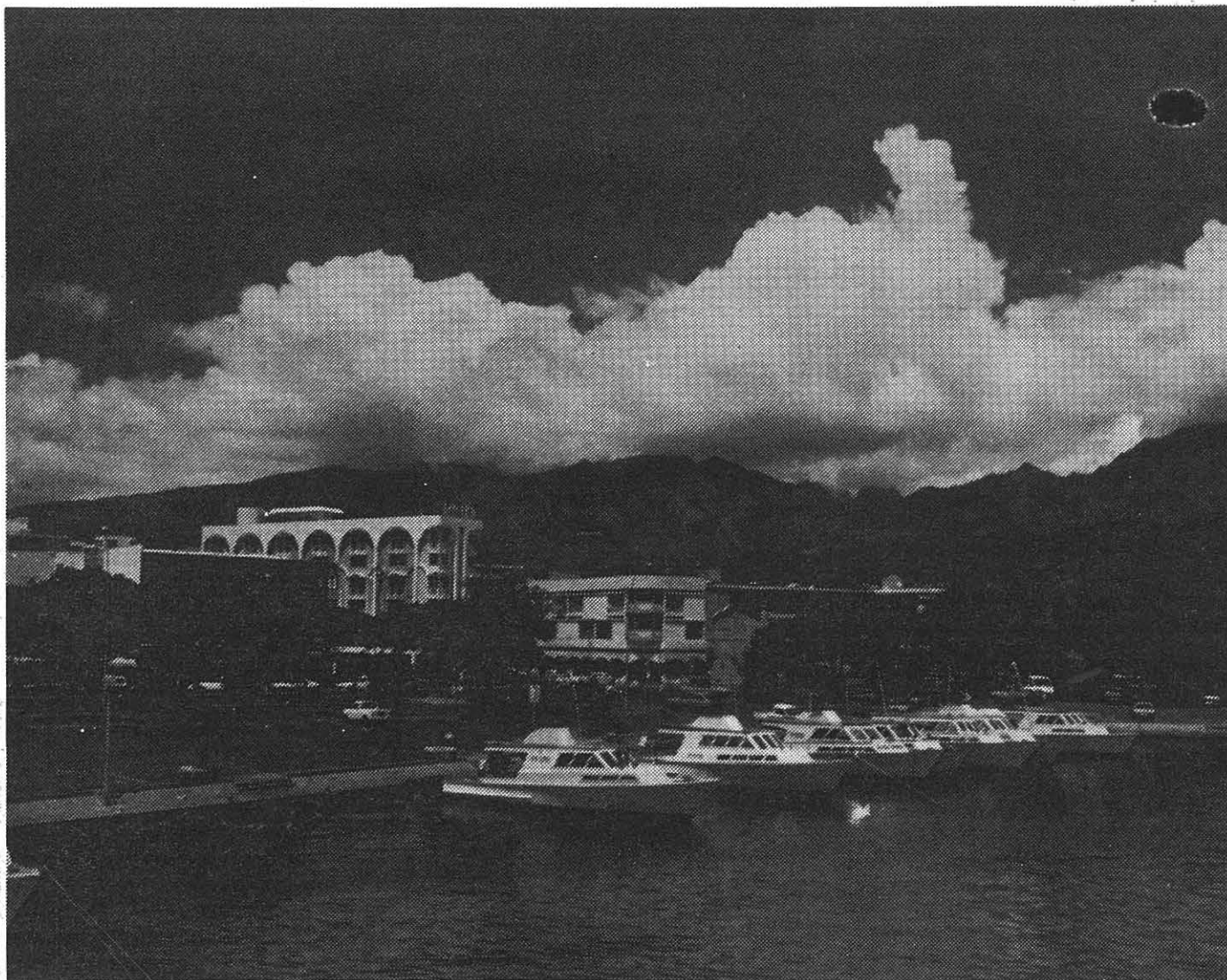
While you can easily find these things here, Tahiti has found -- or more correctly -- another world has found these once-idyllic islands. Our world, the fast-vibrating existence we all know and seem to be stuck in, has planted its foot knee deep in the geography of paradise. While we try to escape it, many in Polynesia have discovered that our world -- even with its strategic stresses -- holds a strange attraction for them.

The Tahiti of today is one of 110 islands comprising what we know as French Polynesia; geographically, it's located at about 17 degrees South latitude and 149 degrees West longitude. What's made the islands of French Polynesia so important is the fact that they're in just about the middle of the Pacific Ocean; perfectly placed to help provision the ships of earlier explorers and merchants. This location midway between the Americas, Australia, and Asia has kept tourism alive for more than 200 years now and, with recent developments half a world away, Polynesian vacations should be even more popular.

Amazingly enough, most of French Polynesia has successfully resisted many of the world's more compelling strides of progress due simply to its relative isolation. The French possession is made up of five widely spaced groups of islands called archipelagos; the Marquesas, the Tuamotu atolls, the Gambier Islands, the Austral Islands, and the Society Islands -- the largest of which is Tahiti. Most of the outer island groups are sparsely populated and have experienced comparatively little development; given a little time and some ingenuity on your part, you can still find a totally isolated chunk of paradise all to yourself there.



Broadcasting in French Polynesia is headquartered here in downtown Papeete where the government-owned and well-equipped studios produce both radio and television programming. RFO translates to Radio France Overseas.



The Tahiti of today features Papeete, a bustling city of 30,000 with a beautiful tropical island as a backdrop. (All photos by Dave Rosenthal)

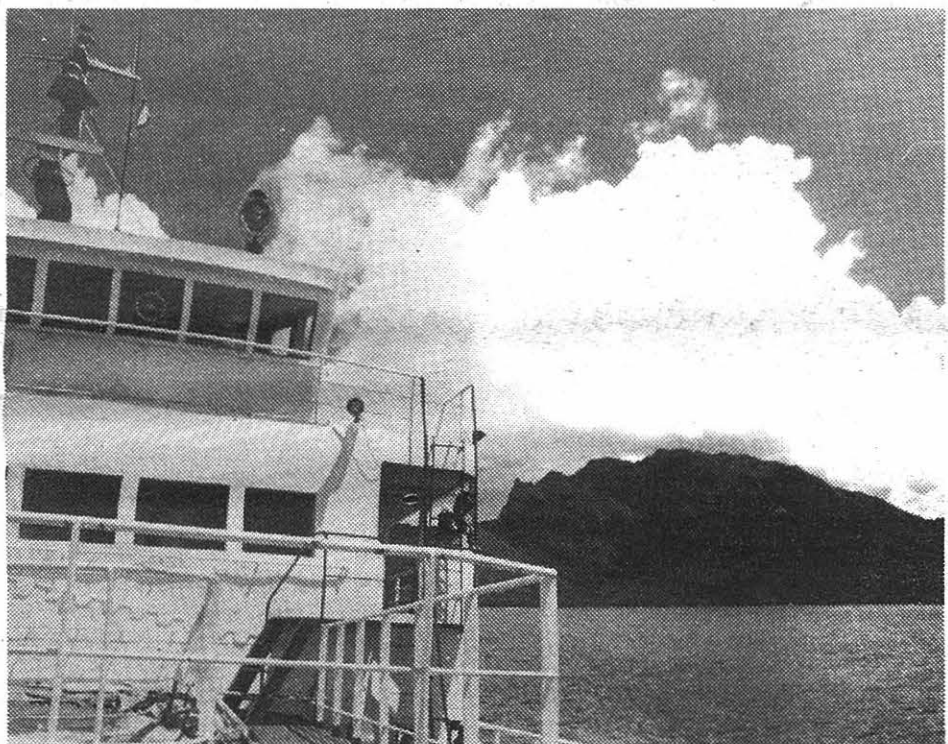
On the other end of the scale is Papeete. Located on the northwest end of the island of Tahiti, Papeete is the largest -- and only city to be found in Polynesia. No matter what develops anywhere else in the islands, everything coming in or out is funneled through this incredibly busy port. Considering the fact that comparatively very few consumer goods are produced here, the majority of everything people use must be imported as well.

Home to only about 30,000 people, Papeete possesses all the cosmopolitan amenities imaginable in one form or another and has become the hub of all the activities in its part of the world. With investment and development continuously pumping more and more into the economy, it is no surprise that this fast-paced little city is home to Polynesia's broadcasting industry as well.

While being well adjusted to the large distances between themselves and just about anything they want, the possibility of rapid -- even instantaneous -- communications seems irresistible to Polynesians. One of the most dependable and successful operations there is the telephone system. From any telephone anywhere, you can dial directly to just about anywhere else -- including internationally. This is quite an achievement considering what you must get



A visit to the RFO radio broadcast booth demonstrated that the world-famous Tahitian hospitality is alive and as healthy as ever.



Shown here is the island of Moorea, sister island to Tahiti, only 12 miles away. Large commercial ferries run continually between these two islands carrying every imaginable cargo. This fascinating trip takes about an hour and a half and will give you a sample of today's French Polynesia you won't find on the guided tour.

through to make a call in other far more advanced countries.

But rapid and wide distribution of information has become important too and, in places as widely disbursed as the islands of French Polynesia, broadcasting presents a special challenge.

Known simply as "RFO," the largest broadcasting operation in the islands is owned and operated by the French government. Translated, RFO means "Radio France Overseas" and this service provides an ever-increasing array of facilities which attempt to cover the five archipelagos--not an easy accomplishment since these five island groups cover an area roughly the size of continental Europe.

Consisting of mediumwave, short-

wave and FM transmitters, RFO's radio programming reaches just about everybody in one form or another. This is very important because one of the most valuable services RFO provides is the on-air broadcasting of short personal messages to people on outlying islands. Television is another story with only the island group containing Tahiti itself, the Society Islands, just recently getting coverage. Plans for complete service are in the offing and there's little doubt that soon you'll be able to take your Watchman with you to your uncharted atoll.

For DXers around the planet, tuning in RFO is an interesting challenge. Even in these times of low solar activity and poor radio propagation,

(Please turn to p.32)

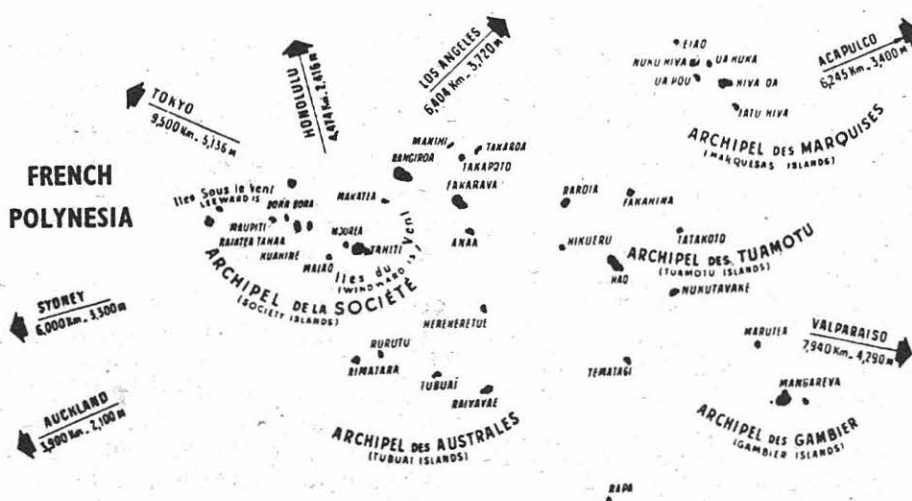
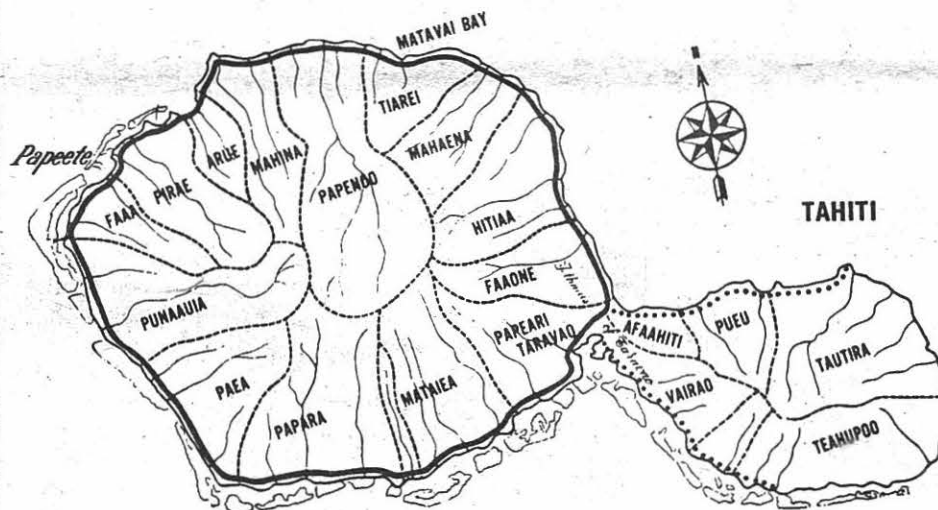
WHERE IS TAHITI?

Consisting of a group of 110 islands, French Polynesia is situated in the South Pacific lying roughly halfway between Australia and Peru. The islands occupy a region from between 7 degrees south to 29 degrees south latitude and from 131 degrees west to 156 degrees west longitude. Population of all the islands totals approximately 130,000.

Best known and most economically important of the islands of French Polynesia is Tahiti, the largest of the western-most island group, the Society Islands. Tahiti has approximately 600 square miles of land area and is shaped like two almost circular, high-crowned limpet shells joined by a narrow isthmus. Tahiti, like many other islands in French Polynesia is volcanic in origin with tall jungle-covered mountain peaks surrounded by a narrow coastal plain.

The tropical climate produces year-round temperatures of from 60 to 90 degrees Fahrenheit with the relative humidity approximately constant at 80%. Rainfall occurs throughout the year but is especially abundant from November to April.

Commerce and government are centered in Papeete, largest (population 30,000) city, located on Tahiti. Historically, the largest industry has been the production of copra but, more recently, tourism has taken a substantial economic lead followed by an even more recent enterprise -- large-scale production of cultured black pearls.



MONITORING THE U.S. NAVY

by Mike Chabak

PART I

2 MHz Marine Operator...

Often after an extended period at sea, personnel aboard a naval vessel returning to port will be permitted to contact friends and relatives on shore. When practical, the Navy ship will utilize the nearest commercial marine operator station to conduct these close-in phone patches.

The naval vessel will ID by name, operating on the ship side duplex channel assigned to that particular marine operator station. COMSEC (communications security) regulations are always in force, but a U.S. naval vessel communicating through a commercial station offers an excellent opportunity to obtain verifications of reception reports.

For your general information, here are the ship/shore marine operator allocated duplex frequencies. Best times to monitor are late afternoon through evening. All are USB voice mode; suppressed center-carrier frequencies are shown.

SHIP	SHORE	SHIP	SHORE
2009	2442	2198	2590
	2466		
	2506		
	2566		
2031.5	2490	2206	2582
	2566		2598
2118	2514	2366	2450
2126	2522	2382	2466
			2482
2134	2530	2390	2566
2142	2538	2406	2442
			2506
2158	2550	2430	2482
			2572
2166	2558	2458	2506

U.S. NAVAL HARBOR CONTROL...

Ships entering or leaving a naval base or shipyard will communicate with the base's control station. The base will use its name plus the word "control" (Mayport Control, Long Beach Shipyard Control, etc). Most often the ship will use its name to ID.

*ABBREVIATIONS

USN -A ship of the line, regular navy; designated: USS (name).
 NRF -Naval Reserve Force ships for training; also designated: USS (name).
 MSC -Military Sealift Command, civilian crew for logistical support or oceanographic research/survey; designated: USNS (name).

These HF transmissions are normally USB voice simplex mode. USN harbor/shipyard frequencies include: 2150, 2434, 2716 and 2836 kHz, with 2716 kHz being the most actively utilized on both coasts.

Normally transmissions are mundane in nature... permission to enter or leave port, arranging for a tug and so on. When ships of the same fleet, destroyer squadron or whatever are on the move together, it is not uncommon to hear ship-to-ship communications on these frequencies.

COMSEC restrictions are minor so here, too, the QSLing percentages are very good. But that is not to say that they do not exist. On occasion, you can hear vessels IDing with an alpha-numeric callsign, such as Golf 4 Uniform. This might also apply to the shore control station. In these instances, COMSEC is in force because the ship utilizing the tac (tactical) mode callsign doesn't want to announce its movements over the airwaves.

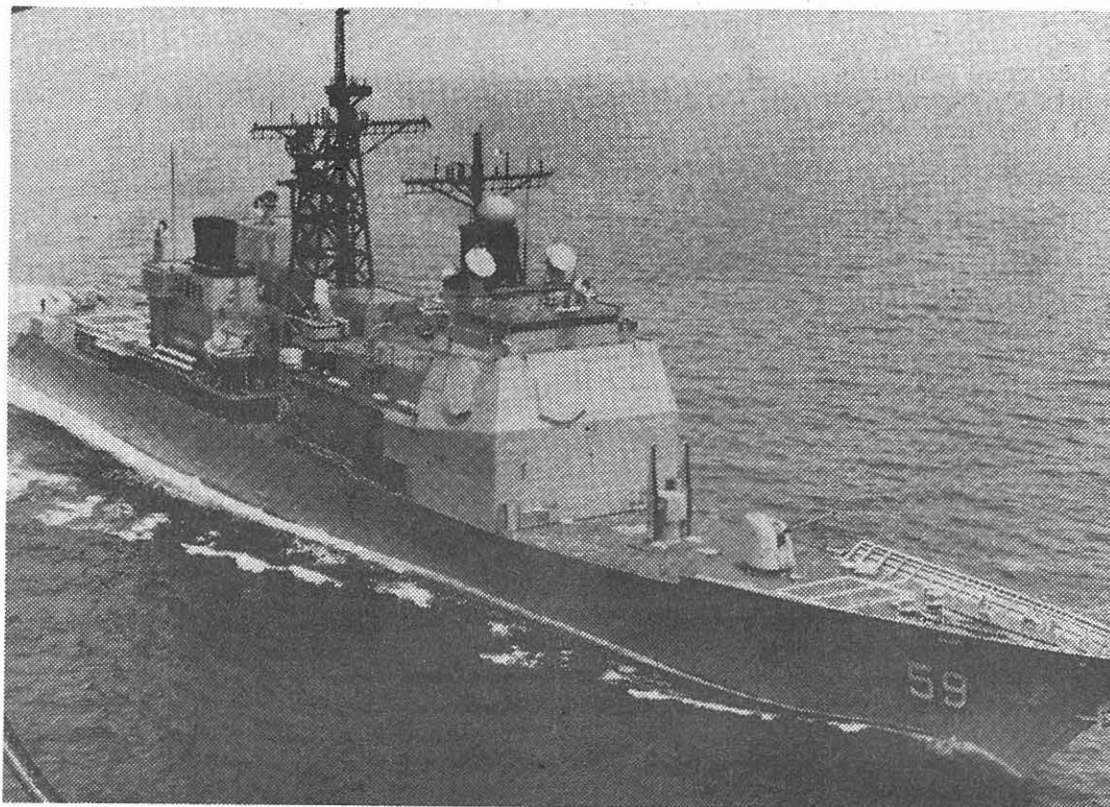
The most frequent user of tac mode callsigns on harbor control frequencies are the fleet ballistic missile submarines. Even if you were somehow able to figure out who was Golf 4 Uniform, forget about sending a reception report; when U.S. Naval vessels transmit in the tactical mode, COMSEC forbids any verification.

It is also to be noted that some naval harbor/shipyard control stations utilize static-type tactical callsigns and operate on frequencies other than indicated. Among the many 2 MHz frequencies so used are 2368, 2586 and 2630 kHz in either the LSB or USB voice mode.

If you live in or within 200 miles of a port area, then 2 MHz frequencies will be accessible to you 24 hours a day. If you live well inland or distant from a particular coastal port, then monitoring can only be accomplished when both you and that area are in darkness. Under good conditions (nighttime during late fall through spring) it will be possible to monitor 2 MHz transmissions from the opposite coast.

If you're a maritime ship buff with a yen towards naval vessels, then monitoring and QSLing ships with names such as the USS Dwight D. Eisenhower, N Jersey, Hammerhead, or Ticonderoga can provide the incentive to sustain y during those dreary, fruitless monitoring sessions.

These and many other ships of the U.S. Naval Fleet can be heard on HF circuit and successfully QSLed, providing that you know where to seek them out a how to get your reception report to them. This two-part article will provide i monitoring tips as well as the hard data necessary for IDing and QSLing US NRF and MSC vessels.*



U.S. NAVY SWITCHBOARD NET...

'Way back when, the USN had a high seas official-type business radio telephone network called NORATS; this abbreviation was later changed to ICSB, and during the early 1980s it became CSS (although the ICSB designation is still sometimes heard).

Currently, there appear to be only two naval shore stations on the CSS net - San Diego and Norfolk. Both use the same set of duplex USB voice frequencies. The ship/shore breakdown is:

4066.1/4360.5 - channel 1
 8247.7/8771.6 - channel 2

Naval vessels will ID by name. Shore is normally referred to and answers up as: "CSS # San Diego (or Norfolk)." Although this is for official USN business (but unclassified), COMSEC can apply in some instances. Because of this, verification percentages average 50/50.

RASPBERRY NET...

This is a USB simplex net between Naval/Marine Corps Air Stations aircraft carriers off the coast. The primary frequency is 6723 kHz. Shore air stations ID as "Raspberry" followed by the airstation name. Examples include Raspberry Norfolk Island and Raspberry Jacksonville.

The aircraft carriers all utilize a static tactical worded callsign. For your information a list is provided of the known tac calls.

Tac calls for the USS Dwight Eisenhower and USS Independence are unknown. The USS Nimitz may be using OLD SALT.

The carriers can ID either by the static callsign as listed above, or by one of the following added to the callsign: "Raspberry," "Control Center," "Ops," or "Operations."

AIRCRAFT CARRIER TACTICAL CALLSIGNS

CLIMAX	USS ENTERPRISE
COURAGE	USS AMERICA
EAGLE CLIFF	USS JOHN F. KENNEDY
FAIRFIELD	USS SARATOGA
GOLD EAGLE	USS CARL VINSON
GRAY EAGLE	USS RANGER
HANDBOOK	USS FORRESTAL
MUSTANG	USS CORAL SEA
PANTHER	USS KITTY HAWK
SCHOOL BOY	USS MIDWAY
SPARTAN	USS LEXINGTON

Aircraft are continually flying between carriers and airstas as part of training, for squadron rotation or transport aircraft movements. You will not hear the aircraft themselves since they are using VHF/UHF frequencies.

The deck-landing training carrier, USS Lexington ("Spartan"), normally works Raspberry Pensacola on 8771.0 kHz rather than 6723 kHz. Even though many of the aircraft carrier tac callsigns are known, COMSEC will prevent any verification.

QSLing the air stations is another matter; "Raspberry" is not a tactical callsign, merely a net identifier for carrier/airstation communications. Best times to monitor are daylight through mid evenings. At night communications can be heard from the opposite coast.

SAR ASSISTANCE...

The rule of the sea is that any vessel in the vicinity of another in distress will render any and all assistance that is required. Here in North America the bulk of SAR (Search and Rescue) operations are conducted by the Canadian and U.S. Coast Guard.

On occasion, a U.S. naval vessel will be in the area and will participate in the SAR operation. It is wise to check out the major USCG ship/shore and air/ground frequencies as well as the two voice mode USB international SAR frequencies, 3023 and 5680 kHz.

Navy ships will ID by name and QSLing them during a SAR operation usually offers an excellent chance for verification.

USN MARS NET...

MARS (Military Affiliate Radio System) is sometimes referred to as "Hams in uniform." All the services have a MARS net to provide servicemen with a radio-telephone or telegram link-up with their friends and loved ones back home. The mode is virtually always simplex USB.

MARS nets also act on a regional exchange basis, too: for those servicemen stationed overseas, many USA based MARS facilities act as a radio "gateway" for these telecomms.

MARS facilities can also be found aboard many U.S. naval vessels, the "MARS Afloat Specialty Net." The USN/USMC MARS prefix, NNN0, is followed by three additional letters that actually identify the station.

During initial callups between ship and shore, the full MARS callsign would be given. For example, the USS Nassau (NNN0CUX) would ID

as "NNN0 Charlie Uniform Xray." Sometimes elements of the same fleet/unit will work the same gateway station; in this instance the shore station will setup a roster, then have each ship in turn make one radiotelephone call. Calls are normally limited to three minutes.

When completed, the next ship on the rotating roster takes its turn. It is an orderly way for many ships to work the same gateway MARS station and, for QSL hounds, an opportunity to log several different ships, making x-number of phone patches within a given time period.

Aircraft carriers have a crew ranging from 2,500 to 3,200 and, because of this, will normally work a MARS gateway station on a frequency other than what the other vessels in its fleet are using.

Once a communications exchange gets going, the identifications usually get shortened to just the suffix call letters. They will either be voiced by letter format or phonetically. Therefore, expect to hear, "CUX this is NIK; go ahead with your next call."

COMSEC forbids any vessel from IDing with its name. Only the MARS callsign will be heard on the MARS net. Likewise, all crew members have been instructed not to divulge their exact location or other particulars that will ID their ship or its current or intended movements.

The following list of USN MARS frequencies are allocated for use by U.S. naval vessels; usage depends upon propagation conditions. Those marked with an *asterisk have been recently used.

USN MARS FREQUENCIES			
4007.0	*7493.5	*13643.0	*14934.0
4013.5	7684.0	*13826.0	16298.5
*4041.0	8031.5	13974.0	16386.0
*4470.5	11538.0	*14383.5	19186.0
4818.5	11653.5	*14441.5	20678.5
5158.0	12047.5	*14467.0	20936.0
7300.0	12122.5	*14470.0	20987.0
7358.8	13378.5	*14477.0	20997.0
7363.5	*13483.5	*14483.5	27962.0
7368.5	13528.5	*14818.5	27974.0
*7391.5	*13538.5	*14838.5	

It should be noted that several USCG Cutters and NOAA oceanographic research vessels are assigned MARS Afloat callsigns.

Success of obtaining a QSL via the MARS circuits varies; some QSL buffs report very high return percentages, while other have found percentages to be 50/50. MARS callsigns are not classified and COMSEC does not restrict verifying MARS communications.

OPERATIONAL COMMS...

The bulk of USN ship communications supports normal operations like war games and exercises. Operational communications all employ the Navy alpha-numeric tactical callsign system. This is a daily changing, randomized setup which utilizes a combination of two letters, three letters, letter and number, or two letters and one number ("Alfa November," "Kilo Echo Juliet," "4 Uniform," "Tango 9 Whisky"). During exercises/war games, sometimes worded tac calls are used. All are valid only for the duration of that particular exercise.

Tac calls are used both by ship and shore stations, and quite often there is no reliable way to determine if what you hear is a ship or a shore installation. COMSEC reigns supreme here, so even in the very rare instances when you can tag a tac call to a specific station, no verification will be permitted.

COMING NEXT MONTH:

MT reviews the new Regency HX1500 hand-held, programmable scanner.

For those that want to wade into the Navy tac mode realm, here is a representative list of USB voice mode HF circuits to check out. ■

USB TAC COMMS

3095	6697	8972	13227
3265	6708	9002	15051
4377	6721	9006	17985
4704	7885	11255	18009
5718	8778	11267	

NEXT MONTH:
QSL'ing the U.S. Navy?!

SUBCARRIER DETECTOR KIT

Tune in "secret" FM broadcasts. Kit covers the new 92 KHz subcarrier as well as the standard 67 KHz. Dual tunable filters in addition to adjustable automatic muting. Use with most any FM radio. Operates on 6 to 17 VDC @ 15 mA. 1½" x 3" x 1" high.

K-713 ADVANCED SCA KIT \$23.50

BUG DETECTOR

Find hidden RF transmitters (bugs) planted in your home, office, car or attached to your telephone line. Designed to locate the most common type of electronic bug - the miniaturized radio transmitter - which can be planted by almost anyone, almost anywhere.

The RF ALERT LED warns you of the presence of a nearby RF transmitter, within the frequency range of 1 MHz to 1,000 MHz. The flashing RANGE LED and audio tone give an indication of the distance to the bug. The SENSITIVITY control, in conjunction with the two LEDs help you quickly zero in on hidden bugs.

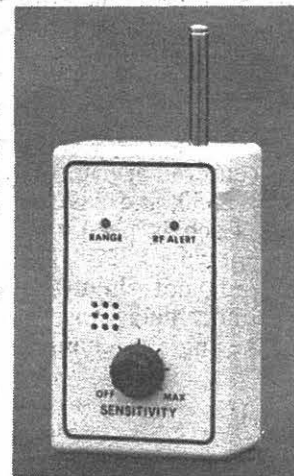
Furnished complete with battery, telescoping antenna, instruction manual and one year Limited Warranty.

TD-17 TRANSMITTER DETECTOR \$98.00

Your complete satisfaction is guaranteed. Mail and phone orders welcome. Add \$2 shipping per order. Send check or money order or we can ship via UPS COD.

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A PROFILE OF U.S. NAVY COMMUNICATIONS--Driver, Va.

by Daniel Simmons

The USN transmitting facility at Driver, Virginia, may be the world's busiest radio facility. Technically known as NAVCAMSLANT (Navy Communications Area Master Station Atlantic), Driver often transmits on over 40 frequencies at a time! Modes in use include SSB, FAX, CW, and various types of RTTY.

Many different types of antennas are found at Driver including one very tall vertical used for encrypted RTTY on 77.15 kHz (see photos).

The RTTY from Driver basically falls into four types:

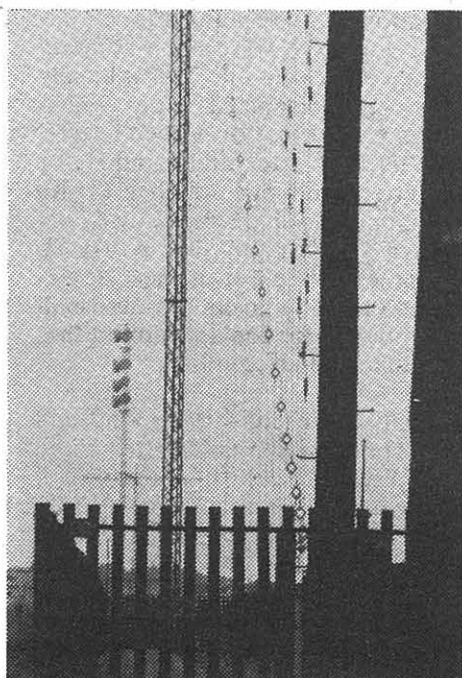
The first type is encrypted 75Bd/850Hz shift RTTY.

The second type is 16 channel/170Hz shift RTTY (FDM). To some, this sounds like a buzz saw when heard on an HF receiver. Often one or two of the channels will be found to be clear (non-encrypted) news or weather. These can be decoded using an Infotech M-605 and M-600, M-6000 or similar equipment.

The third type is the pulse (5ms) code modulated 75Bd RTTY. It has been determined that these transmissions are also encrypted.

The fourth type is seven-fold, frequency-redundant/ seven-fold, time-diverse, frequency-shift-keyed RTTY such as made possible using a 6028 Series modem produced by BR Communications.

In this mode there are seven RTTY channels centered at 850, 1190, 1530, 1870, 2210, 2550, and 2890 Hz in the sideband. Each is used to transmit the same encrypted 75Bd/170Hz shift message, but not simultaneously--a one second keying delay is provided between keying the channels.



Maze of wires create geometric designs; Antennas at Driver, VA

(Note: The channels are not keyed in the order listed above but in an order determined to reduce the effects of interference.) This RTTY mode will probably "get through" when conditions prevent the use of conventional RTTY and this mode is in use by agencies other than the USN.

A Partial Listing of Driver Frequencies

(RTTY is sometimes offset by 2 kHz)

USB:	6697, 11267 (tactical IDs)
CW:	8090, 12135, 16180, 20225
RTTY (inc. FDM):	2426, 2434, 3179, 3269, 4003, 4271, 4443, 5080, 5156, 5343, 5723.5, 5727.5, 6408, 6990, 7782, 7988, 7991, 8029, 8518, 8602, 8977.5, 9033.5, 9403, 9958, 10256, 11068, 11482, 12143, 13572, 14387, 15623, 16090, 17659, 17688
FAX:	3357, 10865, 16410, 20015

MT/IR

A Worldwide Winner!

HCJB, the popular international broadcast station out of Quito, Ecuador, recently conducted a survey of its listeners. In the questionnaire, it asked them "What publications in the radio/electronic/broadcasting fields do you read regularly, excluding club bulletins?"

We are proud to report that *International Radio* (now combined with *Monitoring Times*) came in -- even despite the fact that HCJB's listenership is worldwide and *International Radio* is an almost exclusively North American publication -- number two with 13.1%. That's higher than the industry's "bible," the *World Radio TV Handbook* (#2) and far above the number three publication, Britain's *Practical Wireless*, which came in fourth. According to the results of the HCJB survey, you're now reading the number two -- and growing -- radio publication in the world. And we have you to thank!



October Features

A couple of months ago, *Monitoring Times* challenged you with an article called "Semi Tough." Next month, you'll be pushed to your DX limits with another article, entitled appropriately enough, "Tough." If you're willing to go for the rare DX look for "Tough" in the October issue of *Monitoring Times*.

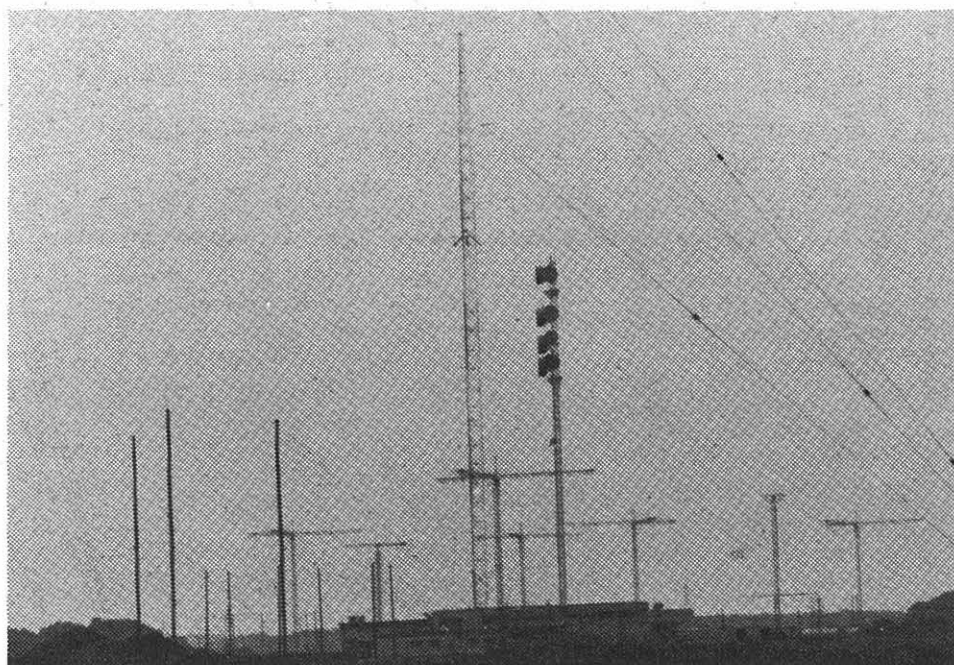
MT's new five man monitoring team swings into action in the October issue. To ensure that you get the absolute best coverage of English language broadcasts to North America, we've now got two monitors on the west coast, one in the midwest and two on the east coast. In short, we've got you covered!

Interested in monitoring military exercises on shortwave? The October issue will feature Air Force communications with hot frequencies throughout the listening spectrum.

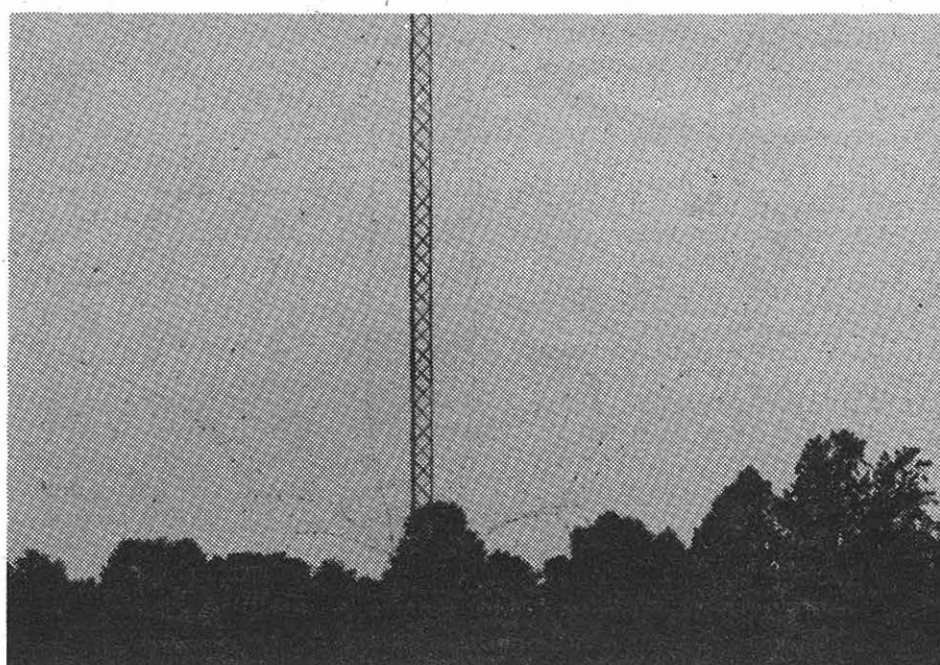
Meet the ultimate DXer. Chance are you won't know his name, but he's one of the most respected DXers in the world -- sought after by governments, agencies and publishers. His name is Tony Jones and when he's not spending time on his ranch in Paraguay, he's tuning in shortwave signals that you and I could only dream of.

Radio direction finding on the 3-30 megahertz shortwave spectrum has always been a problem. Next month *MT* will show you how to build your own RDF system to get a bearing on those unknowns!

Does your receiver really need a preamplifier? A few simple tests can provide the answer. *MT* will tell you what you need to know about receiver preamps in the October issue. Be there!



USN Driver - Tallest tower is for 77.15 kHz



Lacy network of wires at Driver, VA, communications station

ANARCON '86 SCRAPBOOK

"Fun and Games in Montreal": It's ANARC '86

by Larry Miller

He was a man who had obviously spent some time on the streets. But he called himself "the seafarer." Dressed in wide, bell-bottom trousers and sporting a beard that looked like it had survived years of electroshock therapy, he was talking to some listeners at the registration table. At first, the conversation sounded normal enough, if a bit inappropriate for a radio convention. "You're responsible to future generations for wildlife," he said.

Within minutes, however, the man had become highly agitated. "Just look out the window. The seabirds! They're all gone! And I tell 'ya, it's all because of you people and your damn radios!"

Two floors up in the Holiday Inn Place DuPuis, another man -- a regular at ANARC conventions for years -- wandered about the exhibition floor. Clad in a floor-length jacket and wearing a scarf nearly as greasy as his hair, he furiously wrote down the serial numbers of the radios on display at the various booths. When questioned why he did this, he explained calmly that

"It's in case the Russians attack the convention."

And so began the 21st annual Association of North American Radio Clubs (ANARC) convention in Montreal.

ANARC conventions have always been a unique gathering. Participants range from broadcasters and other professionals and ordinary folk like you and me to people, who quite clearly, wear their headphones just a little too tightly about the skull.

This year's convention, sponsored by Radio Canada International and hosted by Ian McFarland, was by far, one of the best -- for both the radio hobby and people watching. Extremely well organized, McFarland deserves applause for his untiring work and incredible effort. And the effort paid off with one of the smoothest running conventions in years.

But what exactly is an ANARC convention? The truth be known, it's quite possible that no one really knows.

Each year, the faithful turn out to stand around and talk DX, attend some rather uninspiring seminars and eat bad hotel food. (This year was no exception regarding the food but the Holiday Inn in Montreal added some new events like trapping convention-goers in elevators, rousting them in the middle of the night to tell them that they had to move out of their room for someone else or come to the desk to put additional money on deposit and generally treating guests like diseased cattle. For a touch of class in Montreal, forget the Holiday Inn.)

For the most part, the event is attended by the "heirarchy" of shortwave: broadcasters, club personnel, well-known DXers, a small handful of listeners and the mildly curious along with some of the others mentioned above.

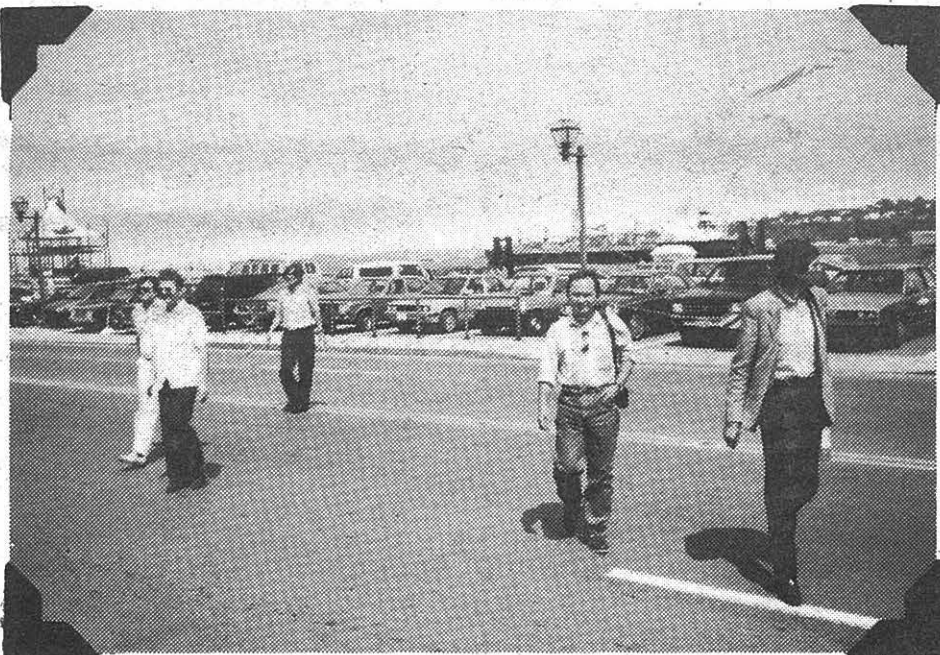
It's not to say that ANARC conventions aren't enjoyable events. They are. It's not to say that there's anything really *wrong* with them. There isn't. It's just that, in the end, the conventions seem to suffer the same

characteristic lack of focus that the entire industry suffers from.

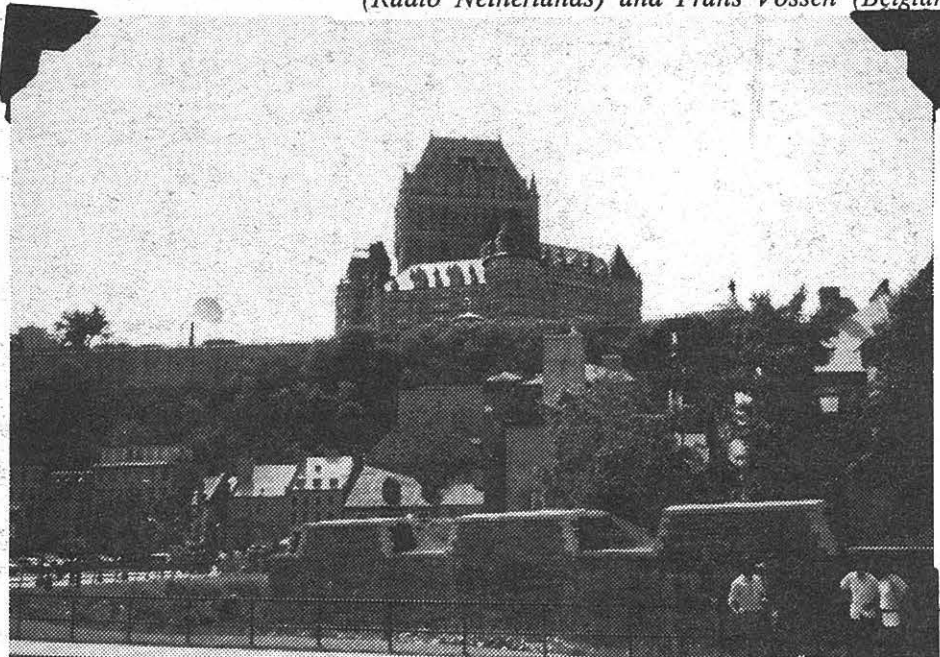
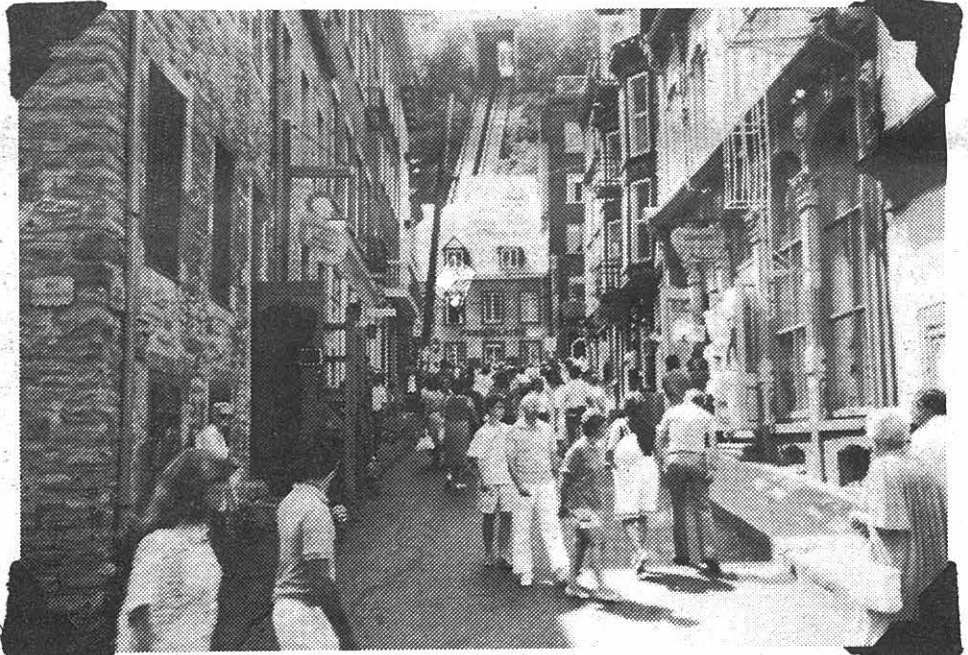
It must be said that over the past few years, ever since the event moved to Canada in 1984, [and 1987] (except for a disastrous run in Milwaukee, Wisconsin, in '85), there has been a consistent improvement in the conventions with a move toward a more general base of entertainment and away from a relentless stream of hard-core seminars on topics like "Diode Replacement in Professional Grade 9 meter Band Receivers for Fun and Profit" and "Predicting Ionospheric Disturbances with Home Appliances."

The question remains: is an ANARC convention worth the roughly \$1,000 it takes for an out-of state visitor to attend? So far, the question is a toss-up.

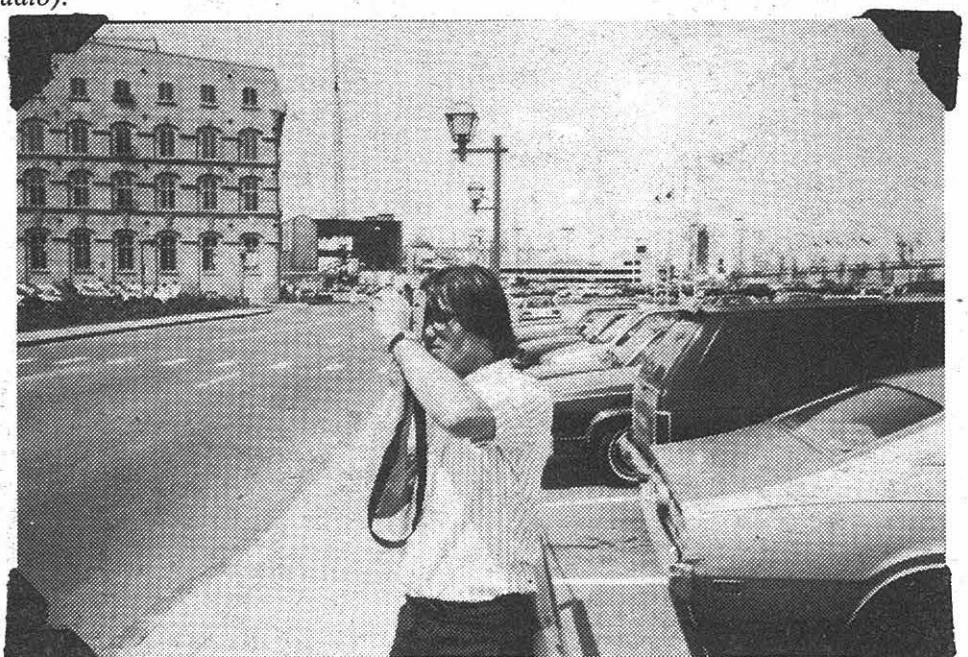
Next year's convention will also be held in Canada, this time in Toronto. Then it's back to the States for a session in either California or Florida.



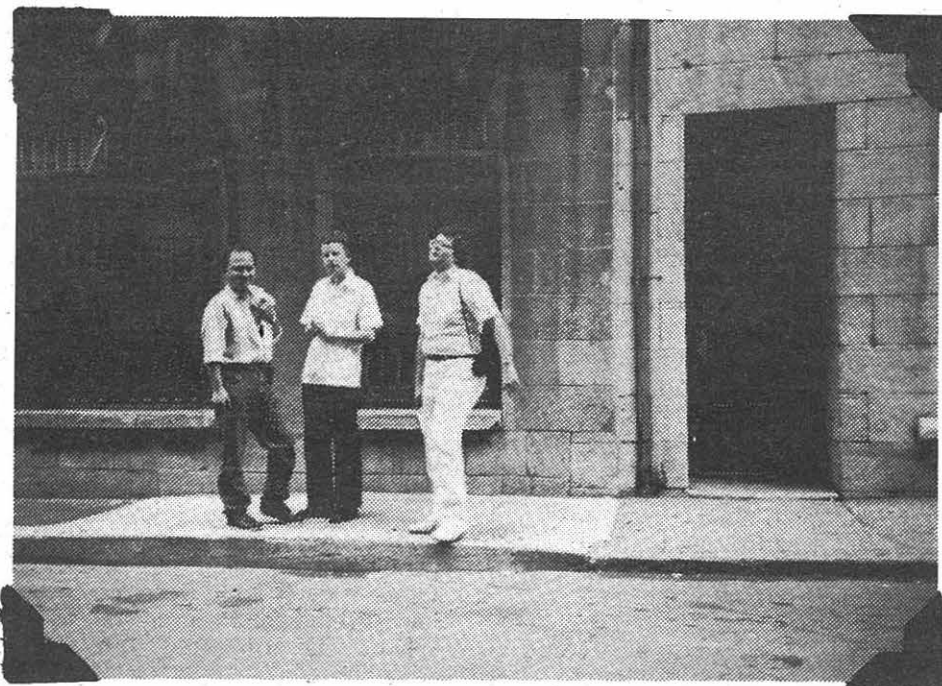
Here come the tourists! A motley crew of broadcasters heads out to explore Quebec City. From left, Jeff White (Radio Discovery), Andy Sennitt (WRTVH), David Monson (formerly Belgian Radio), Alfonso Montelegre (Radio Netherlands) and Frans Vossen (Belgian Radio).



Jeff White finally revealed his reason for wanting to go to Quebec City. He thought that the large building on the hill was the shortwave broadcasters hall of fame and wax museum.



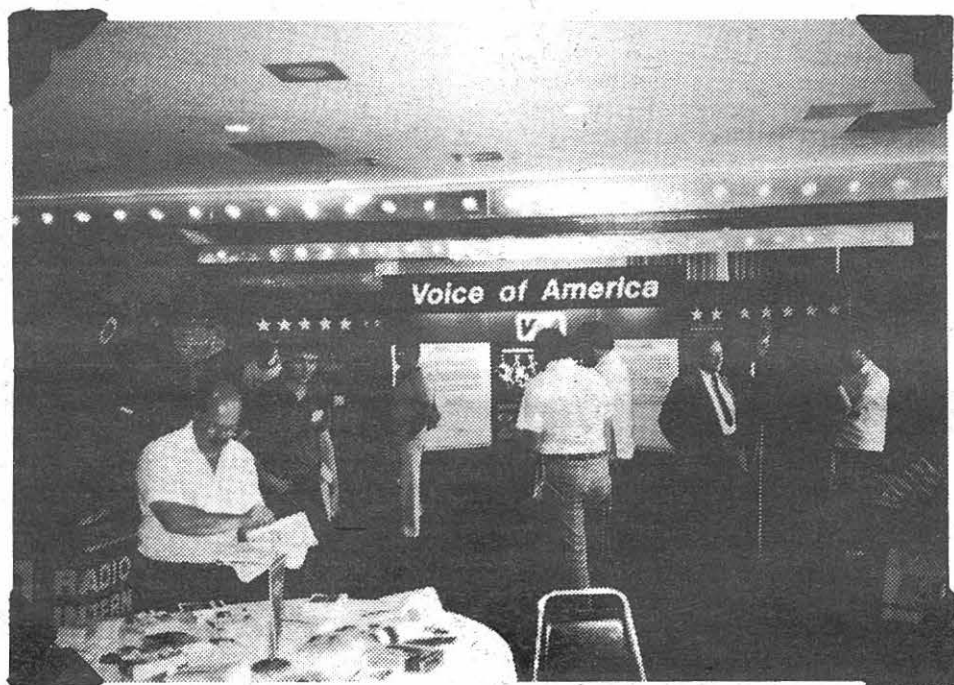
David Monson, suddenly deciding to DX, squints in the bright sunlight to see the digital display of his SONY 2001.



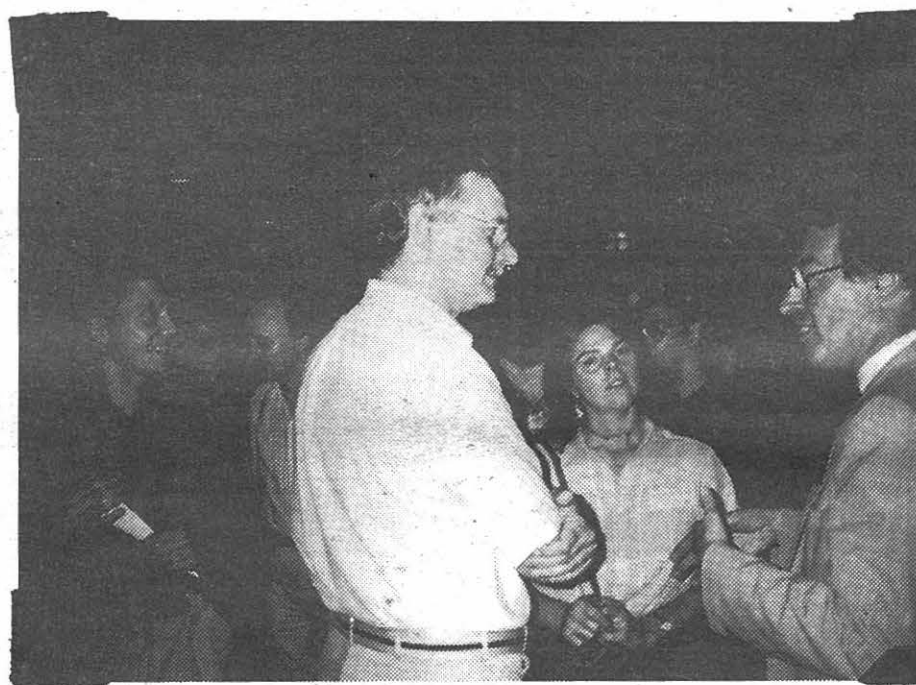
Alfonso Montelegre, Andy Sennitt and Jeff White, hanging out at the back door of the building they mistakenly thought was an international broadcasters hall of fame and wax museum, hoping to catch a glimpse of some shortwave star as he leaves the place.



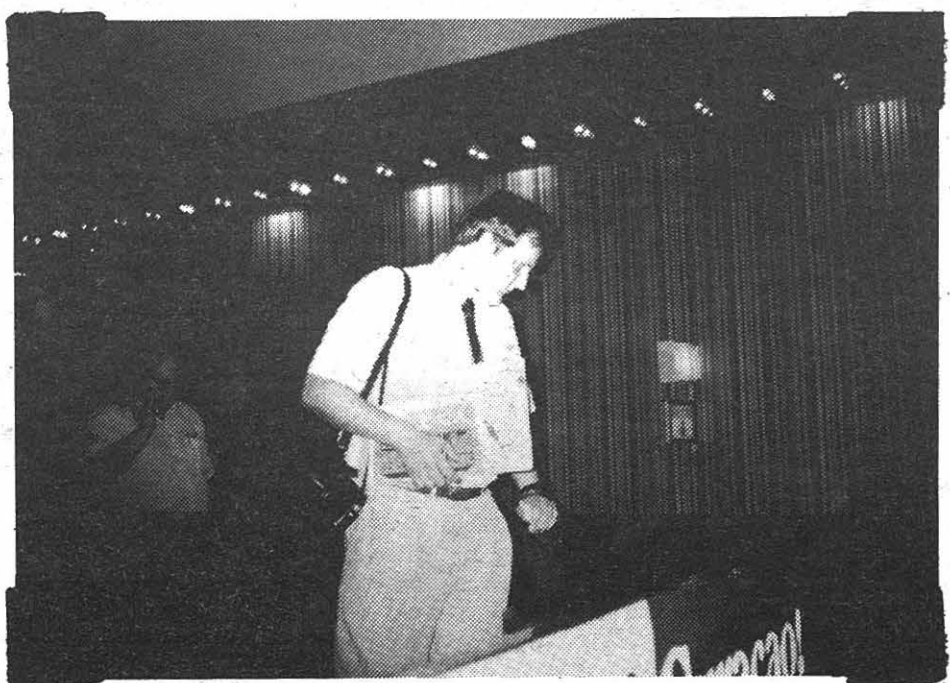
Andy Sennitt, in a private moment, smiles to himself after thinking about Rad Anhanguera, Goiania in Brazil.



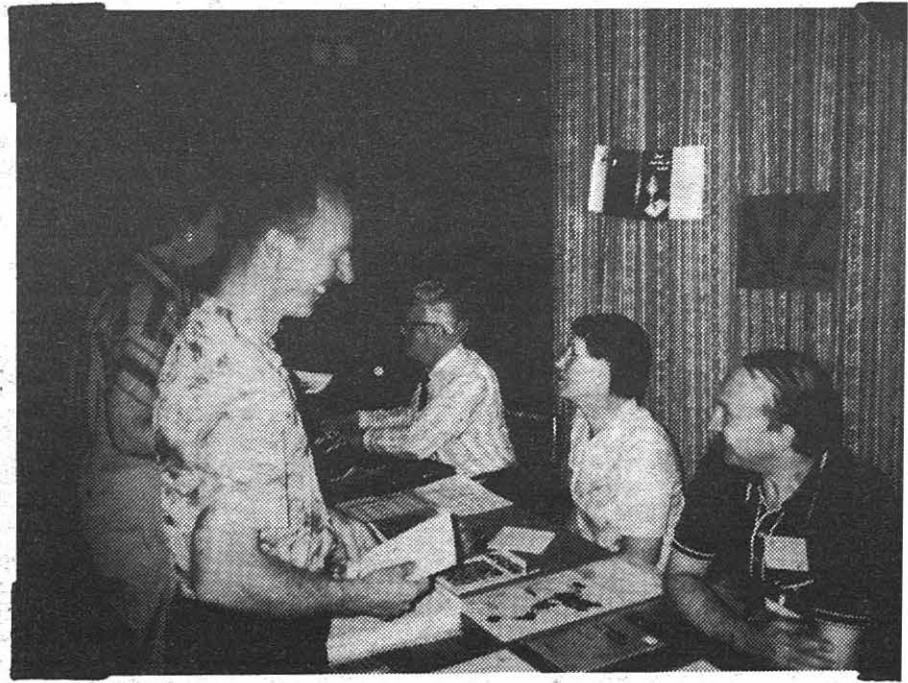
The VOA display at the convention hotel. If you look closely to the right of the last "a" in America, you'll see Ken MacHarg and John Beck of HCJB.



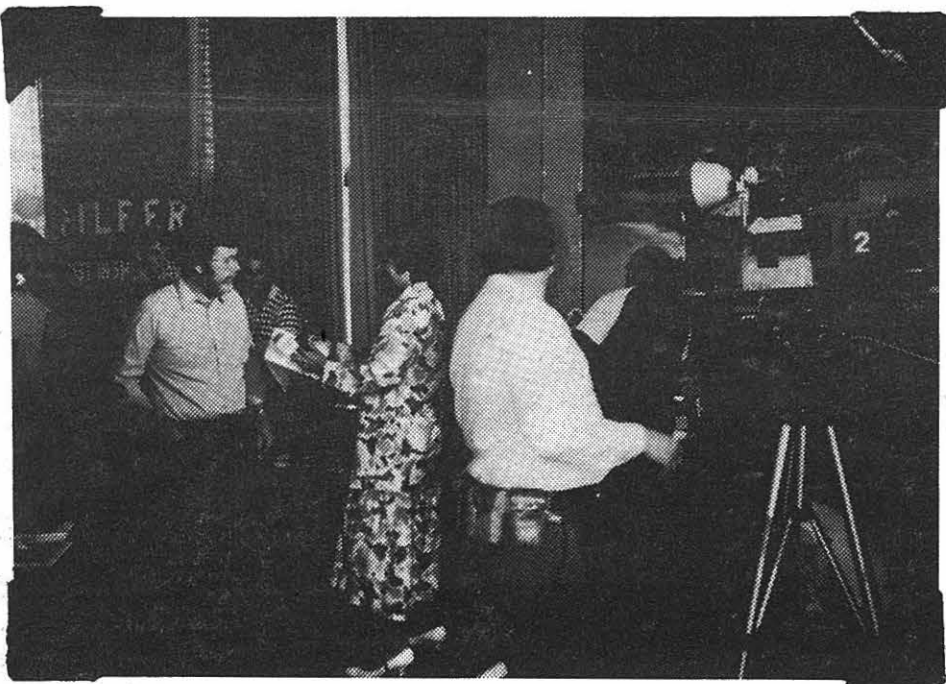
Larry Magne engaging in a lively discussion about a favorite receiver. His wife, Jane, stands patiently to his right, thinking about dinner.



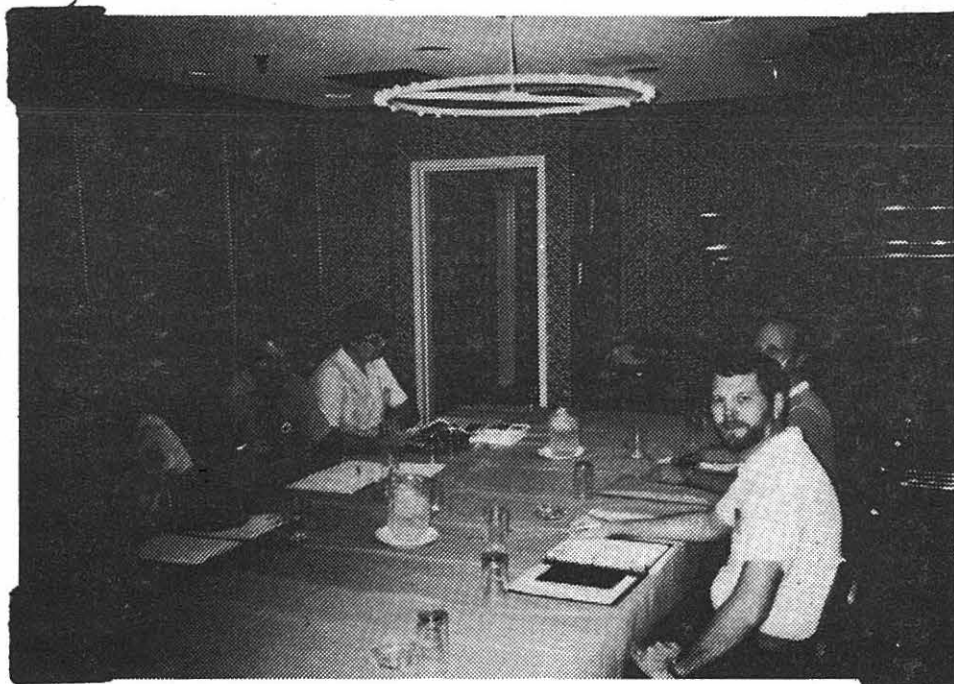
Radio Netherlands' Jonathan Marks, looking very much like he might jump off the balcony, is really only looking for station souvenirs left behind by other convention-goers.



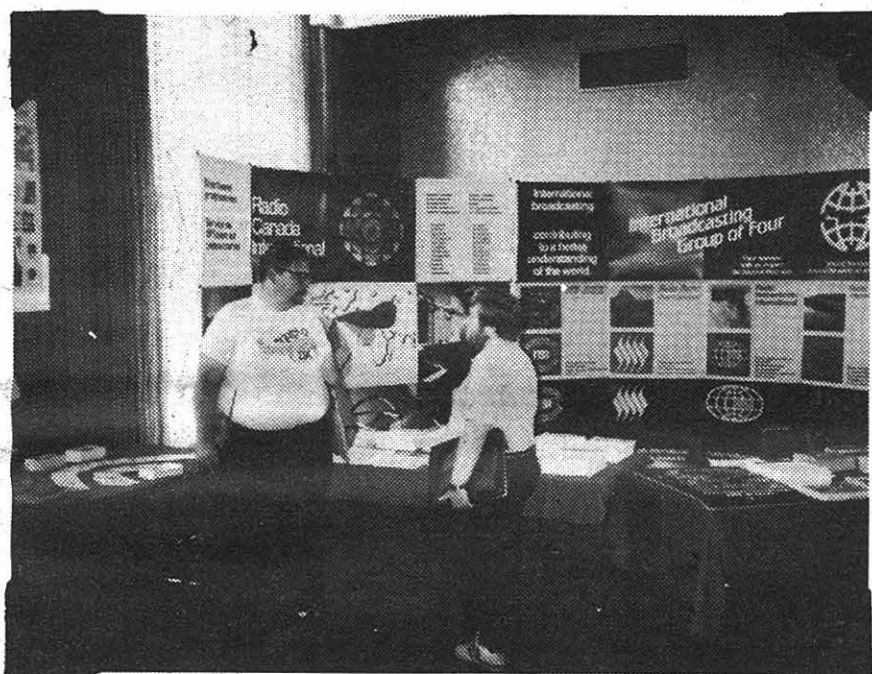
Jean Gillespie of Gilfer Associates and DXer Larry McKinney talk with (from left) Arthur Cushen, his wife, and EDXC head Michael Murray.



Ian McFarland of Radio Canada International being interviewed by a local TV crew. Regrettably, Ian's one chance to get into TV failed when his interview ended up on the editing room floor.



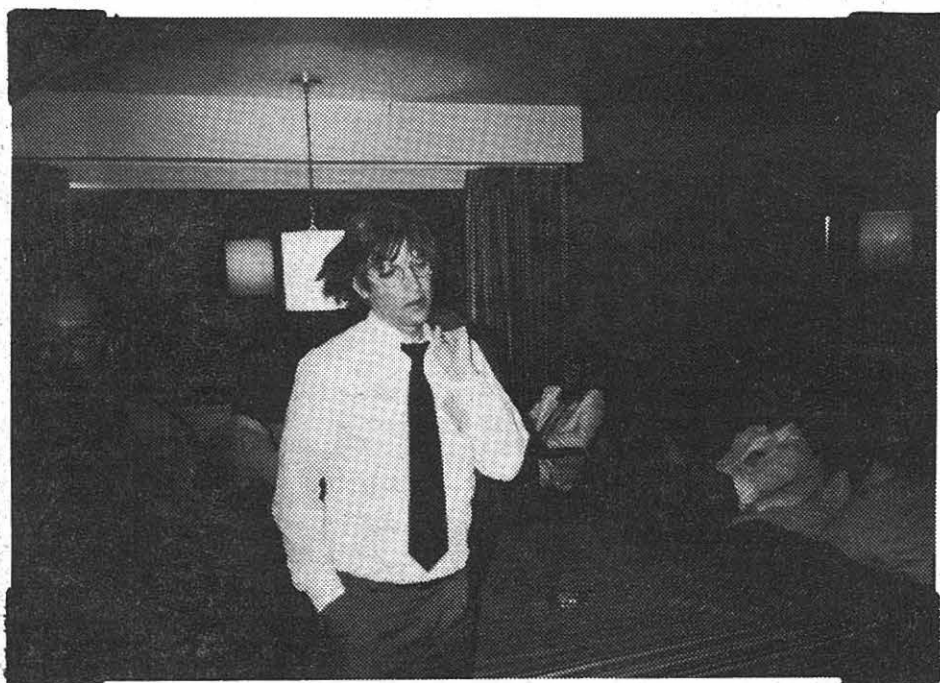
Not a shot of the international broadcaster's wax museum. Instead, an ANARC executive council meeting held during the convention. Executive Terry Colgan is at the far right.



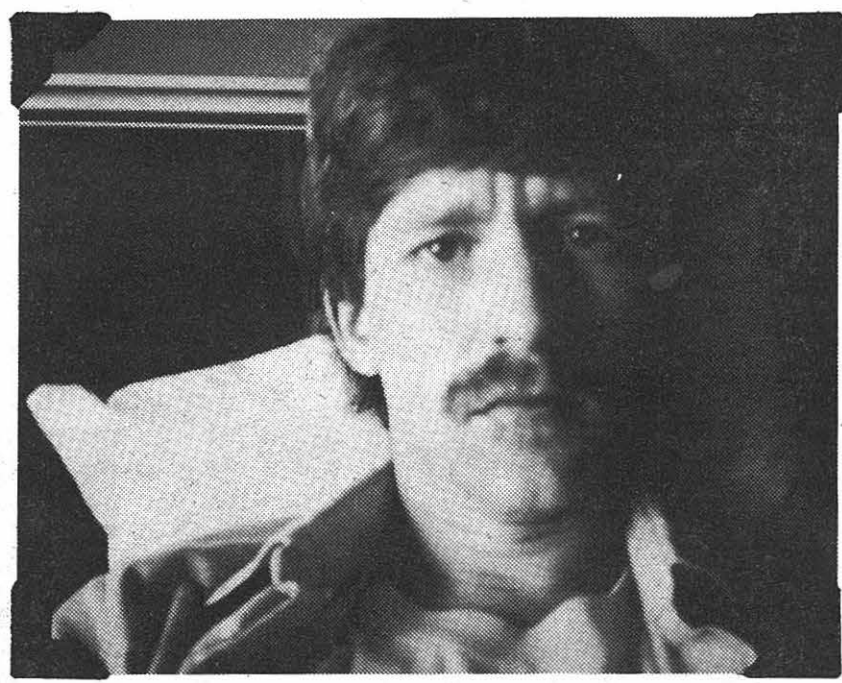
A shortwave listener, wearing a portable scanner in his belt and sporting a snazzy WRNO Worldwide T-shirt, stops to chat in front of the combined Radio Canada International, Radio Netherlands, Radio Sweden International and Swiss Radio International display.



Suzanne Poulos, co-host of Radio Earth's "The World," talks with WRTVH editor Jens Frost. Generally, Suzanne does talk with her eyes open.



A late night gab fest in Larry Miller's room. Believe it or not, virtually all of the problems affecting shortwave were solved here over copious amounts of beer. Center screen: David Monson, overloaded by the power and emotion of the moment, leaves for some fresh air.



MT broadcast editor Larry Miller enjoying himself at the 1986 ANARC convention but secretly wondering to himself when everyone else will leave his room so he can go back to sleep.

Bob Cadman: Canada's "Comfortable Old Slipper"

Ian McFarland, Interviewer

For most shortwave listeners, there are two names that mean Canada. One is the perennially popular host of Radio Canada International's DX program, "Shortwave Listener's Digest," and the other is Bob Cadman.

Cadman, like Mc Farland, considers himself to be a sort of Canadian "ambassador of the airwaves" and he does his job well. To many listeners, Cadman's voice and style is as familiar and comfortable as a pair of old slippers. Probably best known for his appearances on RCI's mailbag show Listener's Corner and Spotlight on Science, he comes across as a person who is not only knowledgeable in his field but who enjoys his work.

Cadman's colleague at Radio Canada International, Ian Mc Farland, interviews the New Brunswick native for Monitoring Times and discovers not only a person who has a sense of humor about the radio business but who is strongly patriotic about Canada.

MT: So many people in the entertainment business these days -- and I guess we can consider international radio part of the entertainment medium -- spend years of their lives driving trucks or waiting tables until they are discovered. How did you get into broadcasting? Did you drive a truck for a while?

Cadman: No, I've never done anything else. As a matter of fact, if the broadcasting business decided that it didn't want me anymore, I don't know what I'd do for a living because that's all I have done.

MT: It'd be terrible to have to go out and get a "real job."

Cadman: I was very fortunate. Well, it was partly persistence and partly good luck, I guess. I went to university in Fredrickton, New Brunswick -- I come from that province -- and when I was in my last year, I decided to get into the broadcasting business. So I sent off applications to every single radio station in eastern Canada.

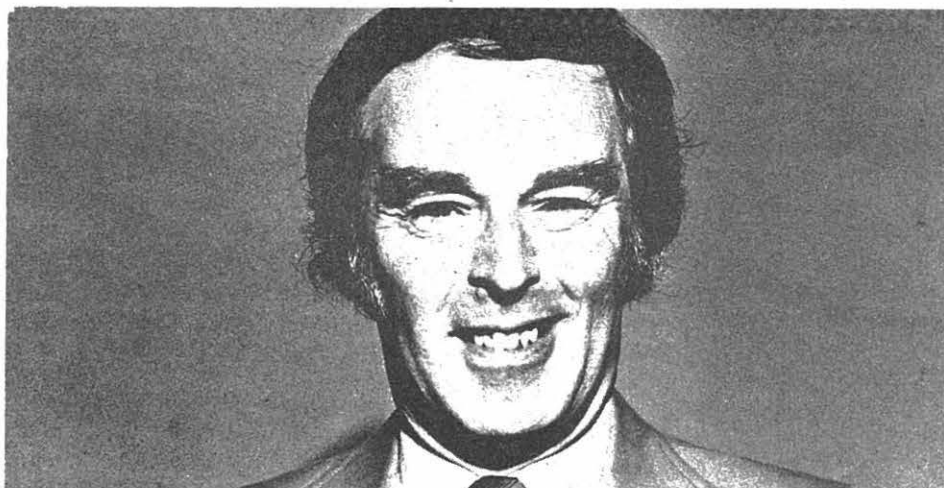
MT: How many stations would you say that was?

Cadman: Probably around fifty. And I got very polite answers from every one, all saying no [laughter]. This was in the year 1950.

Well, I persisted. And shortly after I graduated, I sent another round of letters to the same stations. By that time the Korean War had broken out and quite a few young men in Canada had gone off to serve in the U.N. Force and this left vacancies in various lines of work, including broadcasting. This time I got about six favorable replies.

The local station at St. John, New Brunswick, where I lived came to me -- I had auditioned for them before and had been turned down -- and said, "How about coming to work for us part-time." I only stayed three months. And then I left for a tiny station in a small town.

MT: One of those famous five-watt stations where you get to do



everything from sweeping up the station in the morning to closing it down at night -- virtually being a dog's body.

Cadman: You described it very well indeed. As a matter of fact, "dog's body" isn't a bad choice of words. One of my duties when I arrived first thing in the morning to read the news was to throw the program director and his dog out of the studio. They had been living there ever since he had been thrown out of his apartment for non-payment of rent.

But it was a lot of fun. Some days I worked from six-thirty in the morning when we signed on until eleven o'clock at night. We had no network service. We picked all the records, edited the news, did the announcing and the technical operations. It was the greatest training ground in the world. I made every mistake in the book.

There are some very good schools in Canada that teach broadcasting, but no school can compete with being on the job. Besides, you get paid for it -- though not much.

MT: So how did you get into the "big time." You've been with the CBC [Canadian Broadcasting Corporation] for many years now. How did you get into the CBC?

Cadman: I had applied to the CBC the same time I applied to everyone else and was turned down. But after getting a year's experience being a dog's body at this tiny station without any warning, a letter came in the mail. And it was an application form from the director of the CBC the Maritimes -- that was in Halifax -- saying "If you're still interested why don't you fill this out."

I sent in the form, did an audition and not too good a one, I thought and I got the job anyway.

MT: Perhaps they were just very hard up for staff, Bob.

Cadman: It may very well have been.

MT: How did you end up going from the Maritimes to the International Service?

Cadman: I worked for the CBC the Maritimes for 12 years and then meant domestic radio and TV. After then 21 years ago, I transferred to the CBC in Montreal. And one of the great attractions in coming to Montreal was the possibility of working with Radio Canada International. I was fascinated with the idea of broadcasting to the world. It seemed a very important thing to do.



African Service Service de l'Afrique

Production Team L'Équipe de production

Bob Cadman Announcer-Producer Annonceur-réalisateur	Ousseynou Diop Manager Chef de service
Aldo Marchini Announcer-Producer Annonceur-réalisateur	Wojtek Gwiazda Production Assistant Assistant à la réalisation
Denise Cuillierier Assistante à la réalisation Production Assistant	Michèle Boisvert Annonceur-réalisateur Announcer-Producer



**Radio Canada
International**

B.P. 6000
Montréal, Canada
H3C 3A8

When I came here, you worked not only for the international service, but you also worked for television and for the domestic service on radio. In fact, you were running back and forth from studio to studio. I remember completing a television interview show and ten minutes later I would be on the air on the international service doing something else. It was great, fun but it was hectic.

I watched a number of people on shortwave go on the air, get confused and and say that they were on radio when they were really on TV and vice versa. It was really very easy to do [laughter]. In the end, its been very satisfying, though.

I think it's so important for this country to present our point of view on the international airwaves and to tell people in other countries something about Canada.

But that doesn't mean that I only talk about the good things in my country. The only way you can be credible in broadcasting is to tell the truth as you see it.

MT: Warts and all.

Cadman: I think anyone who has listened to me, especially on *Listener's Corner* will know that we don't shy away from things that are considered to be wrong with this country. I think that that's the only way to do it.

I also do happen to think that Canada is a very fine country. Maybe that's patriotism but I'm not ashamed of that one bit. I happen to like my country. I want people in other parts of the world to know what a fine country Canada is.

MT: Do you have much inclination to do much shortwave listening on your own?

Cadman: I don't have a great deal of time to do that, to be quite frank. When I'm not occupied in my private life, I do spend a fair amount of time reading newspapers and magazines and books in certain fields.

But every once in a while the shortwave listening "bug" gets me and I'll haul the radio down and maybe, for a week or so, I'll drive my wife and the dog crazy listening to every station that I can get. And then it will wear off for a while and I won't listen very much for some time. But I do think it's a good idea to hear what other stations are doing and to some extent, what we're doing here at RCI. So while I'm not what you would call a full-time shortwave listener, I do it by fits and starts.

My wife says that I bring my work home with me too much as it is and she may have a point. Am I married to shortwave or am I married to her?

MT: Having done both the domestic and international service, do you have a preference?

Cadman: I have to say that I enjoyed working on the domestic service. It was a great challenge doing television. I did television news, public affairs programs and a quiz show with high school students for nineteen years.

MT: That sort of work has the advantage of being better for the ego. People on the street who have watched you know who you are. In international radio broadcasting

you're a totally anonymous person at home.

Cadman: I don't really care about that. It's nice when someone recognizes you on the street in Montreal and says, "Hello! I know you! How are you!" That's very flattering. But I didn't go into this business for ego gratification. I went into it because there is a great satisfaction in writing something, producing something or performing

something. This is the kind of satisfaction that I get. And I get more of it from working on the air at Radio Canada International.

I would not now want to go back to the domestic service of the CBC.

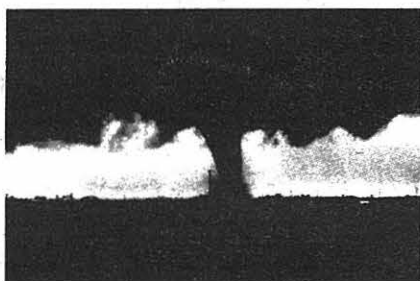
MT: You obviously enjoy what you're doing as anyone who listens to the programs on RCI can tell.

(Please turn to p.17)

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Check the local weather

MORE CHANNELS PLUS AIRCRAFT

Regency's most popular portable scanner, the HX1000, has just been improved! The new HX1200 has all the same important features of its predecessor; keyboard programmability (no crystals are required), a rugged die cast aluminum chassis, display messages, preprogrammed frequencies, liquid crystal display, sealed rubber keyboard, direct access, and priority control. In addition, the new HX1200 has 45 memory channels, covers seven public service bands plus the aircraft band, and has a permanent EAROM memory circuit that



Model HX 1200

never needs batteries. Plus a handy wall charger, carrying case, belt clip, earphone, flexible antenna and rechargeable Nicad battery are included.

800 MHz

For those of you who live in an area where public service frequencies use the new 800 MHz band, Regency offers the HX2000. It covers VHF and UHF frequencies plus the 800 MHz and aircraft bands. Like the HX1200, the HX2000 is keyboard programmable, so no crystals are required. Other features include a 20 channel memory, liquid



Hear the action of a three alarm fire

crystal display with programming messages, priority control, and memory battery. Plus, each HX2000 comes complete with a wall charger, belt clip, 2 antennas, and rechargeable Nicad batteries.



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RADIO ACTIVITY

...information from the pages of **SPEEDX**

EDITED BY: **J. Speed Gray**
1260 Troon Court, S.E.
Grand Rapids, MI 49506-9732

Hello readers and welcome to the first edition of the SPEEDX's Radioactivity. This column is provided by SPEEDX as a service to Monitoring Times to promote Shortwave Listening. Most of you have probably read shortwave logging columns before. When asked by SPEEDX to prepare a logging column for Monitoring Times, I wanted to approach the subject from something different than the typical listings of shortwave logs. I believe the format for this column will please you, as it will combine not only loggings, but station schedules, and QSL card reports into one handy, condensed guide for you to follow. Please, let me know how you like it! Here goes with column #1!

ALBANIA: Radio Tirana; NAm schedule includes EE at

0000-0030-	9750 and 7065
0130-0200-	9750 and 7120
0230-0300-	9750 and 7120
0330-0400-	7300 and 6200
1230-1300-	11960 and 9515

LOGGINGS FOR ALBANIA:

6200	0330	Radio Tirana; EE: IS and YL w/nx. New Zealand Gov't will continue its anti-nuclear policy. By Stanley-AZ (433 4-29).
7065	0000	Radio Tirana; EE: IS & ID, nx and rpt on elections in Albania. By Baldwin-NY (444 4-28).
7120	0150	Radio Tirana; EE: blasting Reagan and US. // to 9760. By Phillips-PA (422 4-28).
9480	2200	Radio Tirana (European Service); EE: nx and cmty on US secret optns in Nicaragua. By Weikel-MI (4-20).

QSL Report from Radio Tirana:

7065 p/d card in 96 days. (By Coday-CA); in 157 days. (Brown-IL); 9760 p/d card in 135 days for 3 IRS. (By Bair-CA).

CHINA, PEOPLE'S REPUBLIC:

4045	1200	FFS-1 (Voice of the Straight); CC: Man and woman talking; f/out 1335 UTC. By Donegan-CA.
5040	0900	Fujian PBS-Fuzhou; CC: talk and some music. Bowden-CA
11455	0830	Radio Beijing; EE: talk on "Hands Across America." By Zirkelbach-CA

CLANDESTINE:

6545	0210	Radio Venceremos; SS: in the clear with strong signal and usual anti-El Salvador govt. pgm. Music jammer moving from 6555 up to 6565 obviously looking for this but looking in the wrong direction. By Santosuosso-FL (7-19)
9940	2149	Radio Camilo Cienfuegos, La Voz del CID; SS: apparent program on early history of Florida from 2149 until abrupt off at 2152. At 2156 returned with completely different pgm on current events. By Santosuosso-FL (7-11)

ECUADOR: HCJB, Quito

EE Service to NAm:

1200-1600	11740, 15115, 17890
0030-0700	9870, 15155
0030-0130	11910
0200-0700	6230
0500-0700	11910

HCJB is one of the most popular shortwave broadcast stations featuring religious programming. Their signals into North America are so strong that HCJB may be received regularly. In addition to the frequencies listed above, log reports have also included 3220, 6205, 9735, 15115, 15270, 17790.

QSL Reports from HCJB:

6230- 34 days. (Wilkins-CO); in 37 days for 3 IRCs. in 64 days. By Brown-IL). 9870- in 21 days. (By McCants-AL); in 26 days. (By Thompson-NM); in 30 days. (By Card-RI). 15155- in 44 days. (BY Thompson-NM); in 62 days. (Thompson-NM).

An additional comment about HCJB: For those of you who enjoy listening to DX programs, be sure to tune to HCJB on Saturdays during the 0230 broadcast for the SPEEDX Report, aired at this time. Produced by SPEEDX Staffer David Sharp, exciting DX tips are presented each week for your enjoyment.

IRAQ:

11750 0400 Radio Baghdad: EE; ID, Arabic music. By Walquist-CA

LEBANON:

6550 0215 Voice of Lebanon; AA: Tenetative, 0215-0245, slow inst music and soft ballads, occasional brief annmmts in Arabic, no ID heard. By Santosuosso-FL (7-19).

NORWAY: Radio Norway International, Oslo

Service to NAm in Norwegian:

1200-1245	15310
1400-1445	15310
1500-1545	15310
1900-1945	15310
0000-0045	9580
0100-0145	9580
0200-0245	9605
0300-0345	9580, 9640
0400-0445	9730

Radio Norway International loggings:

9590	0601	RN: EE; nx and feature about Norway, then mx. By Weikel-MI (333 4-20).
11850	1600	RN: EE; nx and pop mx, then "Norway Today" and story or stamp collecting. By Dillon-MD (333).
15165	1218	RN: Norwegian; tx w/interviews abt economic boycott of SA beamed w/two transmitters to S. Asia and Australia. By Westenhaver-QU (444 4-2).
15305	1400	RN: EE; "Trends and Traditions" on values of Norwegian art & antiques overseas. By Fraser-MA (544 4-13).

QSL Report:

RNI: 11850 full data card in 61 days. By Weyrich-MD. 15305 full data card in 30 days. By Brown-IL.

NETHERLANDS: Radio Nederland, Hilversum

B'casts beamed to Americas:

1630-1725	17605	15560
2130-2225	17605	15560
	11730	
0130-2225	9895	6020
0030-0125	15315	6165
2130-0225	9895	6020
0230-0325	9590	6165
0330-0425	9590	6165
1430-0525	9590	6165
0530-0625	9715	6065

LOGGINGS: Radio Nederland

6110	0601	RN: EE; Friends of the Earth anti-nuke group, farmer, and Dutch Dairy industry. By Neff-OH (444 4-10).
9895	0130	RN: EE; IS and ID, "Happy Station", //to 6020. By Dillon MD (333 4-14).
11740	2114	RN: EE; "Happy Stn". By Shaffer-PA (433 4-13).
13770	1500	RN: EE; "SW Feedback", questions on cooperation between SW stations. By Brown-IL (343 4-26).
15560	1431	RN: EE; nx of Am Exp office bombed, "Newline", and "Media Network". By Brown-IL (222 4-24).

QSL Cards:

Radio Nederland for 11740; full data card in 24 days. By George-NC For 15560- card in 25 days. By Brown-IL.

NUMBERS:

11155 Numbers Station; EE: five digit, repeated, 21:22-21:32* female annrc with unusual, very pronounced accent, German or possibly East European. By Santosuosso-FL (7-11).

PAPUA NEW GUINEA: National Broadcasting Commission, Boroko

Port Moresby National Service in EE on the following frequencies 3925, 4830, 4890, 9520, 9575, 11880.

LOGGING REPORTS FOR PPNG:

4890 0800 NBC Port Moresby: EE; TC as 6pm local time, national news and talk on beach development, rock mx, local TC, pop and C&W mx. Various dates. By Sampson-WI (343 4-16); Weikel-MI (222 4-19); Donegan-CA (353 5-15).

QSL CARD REPORT:

NBC: 4890- card in 45 days for \$1.00. By Falbo-OR.

POLAND:

7145 0219 Radio Polonia: EE; Startlingly strong and clear signal. DX Club Show w/ Maria. Reading lots of letters from North America congratulating them on excellent signal, pop mx, nx at 0231. // 7270 poor. Also gave 6095, 6135, 9525, 11815 and 15120 for 0200 xmission. By Miller-PA (7-11)

NSA May Change Computer Code

For some ten years the Data Encryption Standard (DES) developed mutually by IBM and the National Bureau of Standards, has been the code utilized by federal, military and high-ranking industrial and banking interests nationwide. Now, because of increasingly-widespread use--and possible misuse through hacking--the National Security Agency is considering going to a new code.

While it is doubtful that the move by the top-secret security agency will spark any immediate moves by the private sector, they have stated that they will withdraw their support of the present system in 1988. (Contributed by Mel Pratt, Baltimore, MD)

(Cadman, cont'd from p.15)

Cadman: There's no question about that -- particularly in the last few years when I've had the chance to produce and write programs like *Spotlight on Science*. That's one of the favorite shows I do along with the mailbag show, *Listener's Corner*. But the *Spotlight on Science* program is an area where I'm personally interested. I've long had an interest in science, particularly things like astronomy and biology and things like that. And to be able to write and edit stories in that field has given me a great deal of satisfaction.

It's just a shame that here in Canada and the United States so few people have shortwave radios. And a lot of people who have them don't even use them. It's a pity that they don't know all the interesting, amusing and entertaining things that you can find from all the countries of the world on shortwave. Sure, shortwave takes a little more work when you consider all the competing attractions like television and movies and newspapers and that sort of thing. But listening to all the different countries is very stimulating and satisfying and to think that so many people in North America are missing out on that is a great shame.

SOVIET UNION:

13755 1710 Radiostantsiya Rodina: RR; ID "Midnight in Moscow," Russian rock. By Price-PA (\$55)

UNITED STATES:

11930 1700 Radio Marti; SS: Music and talk. Excellent overall reception. By Rinsley-Kansas. 7-12

That about wraps up the column for this month. Hopefully, these few loggings have whetted your appetite for more SW excitement. Remember hundreds of loggings are available each month in the *SPEEDX Bulletin*. For further information, please contact *SPEEDX*, 7738 East Hampton Street, Tucson, AZ, 85715-4212. Tell them Monitoring Times sent you!

See you next month; until then, good listening . . .

NEW! Lower Price Scanners

Communications Electronics, the world's largest distributor of radio scanners, introduces new lower prices to celebrate our 15th anniversary.

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List price \$699.95/CE price \$399.95/SPECIAL 10-Band, 20 Channel • No-crystal scanner • AC/DC Frequency range: 25-550 MHz. continuous coverage and 800 MHz. to 1.3 GHz. continuous coverage. The Regency MX7000 scanner lets you monitor Military, Space Satellites, Government, Railroad, Justice, Department, State Department, Fish & Game, Immigration, Marine, Police and Fire Departments, Broadcast Studio Transmitter Links, Aeronautical AM band, Aero Navigation, Paramedics, Amateur Radio, plus thousands of other radio frequencies most scanners can't pick up. The Regency MX7000 is the perfect scanner to receive the exciting 1.3 GHz. amateur radio band.

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Regency® RH250B-EA

List price \$674.30/CE price \$329.95/SPECIAL 10 Channel • 25 Watt Transceiver • Priority The Regency RH250B is a ten-channel VHF and mobile transceiver designed to cover any frequency between 150 to 162 MHz. Since this radio is synthesized, no expensive crystals are needed to store up to ten frequencies without battery backup. All radios come with CTCSS tone and scanning capabilities. A monitor and night/day switch is also standard. This transceiver even has a priority function. The RH250 makes an ideal radio for any police or fire department volunteer because of its low cost and high performance. A 60 Watt VHF 150-162 MHz. version called the RH600B is available for \$454.95. A UHF 15 watt version of this radio called the RU150B is also available and covers 450-482 MHz. but the cost is \$449.95.

NEW! Bearcat® 50XL-EA

List price \$199.95/CE price \$114.95/SPECIAL 10-Band, 10 Channel • Handheld scanner • AC/DC Frequency range: 29.7-54, 136-174, 406-512 MHz. The Uniden Bearcat 50XL is an economical, hand-held scanner with 10 channels covering ten frequency bands. It features a keyboard lock switch to prevent accidental entry and more. Also order part # BP50 which is a rechargeable battery pack for \$14.95, a plug-in wall charger, part # AD100 for \$14.95, a carrying case part # VC001 for \$14.95 and also order optional cigarette lighter cable part # PS001 for \$14.95.



NEW! Scanner Frequency Listings

The new Fox scanner frequency directories will help you find all the action your scanner can listen to. These new listings include police, fire, ambulances & rescue squads, local government, private police agencies, hospitals, emergency medical channels, news media, forestry radio service, railroads, weather stations, radio common carriers, AT&T mobile telephone, utility companies, general mobile radio service, marine radio service, taxi cab companies, tow truck companies, trucking companies, business repeaters, business radio (simplex) federal government, funeral directors, veterinarians, buses, aircraft, space satellites, amateur radio, broadcasters and more. Fox frequency listings feature call letter cross reference as well as alphabetical listing by licensee name, police codes and signals. All Fox directories are \$14.95 each plus \$3.00 shipping. State of Alaska-RL021-1; State of Arizona-RL025-1; Baltimore, MD-Washington, DC-RL024-1; Buffalo, NY/Erie, PA-RL009-2; Chicago, IL-RL014-1; Cincinnati/Dayton, OH-RL006-2; Cleveland, OH-RL017-1; Columbus, OH-RL003-2; Dallas/Ft. Worth, TX-RL013-1; Denver/Colorado Springs, CO-RL027-1; Detroit, MI/Windsor, ON-RL008-3; Fort Wayne, IN/Lima, OH-RL001-1; Hawaii/Guam-RL015-1; Houston, TX-RL023-1; Indianapolis, IN-RL022-1; Kansas City, MO/KS-RL011-2; Long Island, NY-RL026-1; Los Angeles, CA-RL016-1; Louisville/Lexington, KY-RL007-1; Milwaukee, WI/Waukegan, IL-RL021-1; Minneapolis/St. Paul, MN-RL010-2; Nevada/E. Central CA-RL028-1; Oklahoma City/Lawton, OK-RL005-2; Orlando/Daytona Beach, FL-RL012-1; Pittsburgh, PA/Wheeling, WV-RL029-1; Rochester/Syracuse, NY-RL020-1; San Diego, CA-RL018-1; Tampa/St. Petersburg, FL-RL004-2; Toledo, OH-RL002-3. New editions are being added monthly. For an area not shown above call Fox at 800-543-7892. In Ohio call 800-621-2513.

NEW! Regency® HX1200-EA

List price \$369.95/CE price \$214.95/SPECIAL 8-Band, 45 Channel • No-crystal scanner • Search • Lockout • Priority • Scan Delay • Sidelit liquid crystal display • EARMEMORY New Direct Channel Access Feature Bands: 30-50, 118-136, 144-174, 406-420, 440-512 MHz. The new handheld Regency HX1200 scanner is fully keyboard programmable for the ultimate in versatility. You can scan up to 45 channels at the same time including the AM aircraft band. The LCD display is even sidelit for night use. Order MA-256-EA rapid charge drop-in battery charger for \$84.95 plus \$3.00 shipping/handling. Includes wall charger, carrying case, belt clip, flexible antenna and nicad battery.

NEW! Bearcat® 100XL-EA

List price \$349.95/CE price \$203.95/SPECIAL 9-Band, 16 Channel • Priority • Scan Delay • Search • Limit • Hold • Lockout • AC/DC Frequency range: 30-50, 118-174, 406-512 MHz. The world's first no-crystal handheld scanner now has a LCD channel display with backlight for low light use and aircraft band coverage at the same low price. Size is 1 3/4" x 7 1/2" x 2 1/4". The Bearcat 100XL has wide frequency coverage that includes all public service bands (Low, High, UHF and "T" bands), the AM aircraft band, the 2-meter and 70 cm. amateur bands, plus military and federal government frequencies. Wow...what a scanner! Included in our low CE price is a sturdy carrying case, earphone, battery charger/AC adapter, six AA nicad batteries and flexible antenna. Order your scanner now.

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List price \$339.95/CE price \$209.95/SPECIAL 8-Band, 20 Channel • No-crystal scanner • Automatic Weather • Search/Scan • AC/DC Frequency range: 30-50, 136-174, 406-512 MHz. The new Bearcat 210XW is an advanced third generation scanner with great performance at a low CE price.

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TEST ANY SCANNER

Test any scanner purchased from Communications Electronics® for 31 days before you decide to keep it. If for any reason you are not completely satisfied, return it in original condition with all parts in 31 days, for a prompt refund (less shipping/handling charges and rebate credits).



NEW! Bearcat® 800XL-EA

List price \$499.95/CE price \$317.95 12-Band, 40 Channel • No-crystal scanner • Priority control • Search/Scan • AC/DC Bands: 29-54, 118-174, 406-512, 806-912 MHz. The Uniden 800XL receives 40 channels in two banks. Scans 15 channels per second. Size 9 1/4" x 4 1/2" x 1 1/2".

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RD95-EA Uniden Remote mount Radar Detector \$128.95
RD55-EA Uniden Visor mount Radar Detector \$98.95
RD9-EA Uniden "Passport" size Radar Detector \$239.95
BC-WA-EA Bearcat Weather Alert* \$49.95
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PC55-EA Uniden mobile mount CB transceiver \$59.95
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MA257-EA Cigarette lighter cord for HX1200 \$19.95
MA917-EA Ni-Cad battery pack for HX1200 \$34.95
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frequency SECTION

Now:

You can be a part of the MT Monitoring Team. We welcome your observations, frequency updates, corrections and additions. Send them to Larry Miller, Frequency Coordinator, Monitoring Times, Box 691, Thorndale, PA 19372. Everyone whose material is used will receive a handsome certificate of appreciation from Monitoring Times. Thanks!

This Month:

Steve Forest, Cincinnati, OH; Mike Peters, St. Petersburg, FL; Steve Walley, Moreno Valley, CA; Pete Walquist, Reseda, CA; Martin Shalley, Lima, OH; Jeff White, St. Petersburg Beach, FL; Dr. Donald Rinsley, Topeka, KA.

New Frequencies of Note:

Evening transmission by Radio Baghdad on 11750. New English broadcast from R. Clarin 2300-0000 UTC. Tentative and test transmissions from KDSA (Adventist World Radio, Guam) and Christian Science Monitor.

LEGEND:

- * The first four digits of an entry are the broadcast start time in UTC.
 - * The second four digits represent the end time.
 - * In the space between the end time and the station name is the broadcast schedule.
 - S=Sunday, M=Monday, T=Tuesday, W=Wednesday, H=Thursday, F=Friday, A=Saturday.
 - If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.
 - * The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "v" for a frequency that varies.
 - * Frequencies in bold are most likely to be heard regularly in North America.
- We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

0000 UTC	[8:00 PM EDT/5:00 PM PDT]
0000-0015	Voice of People of Kampuchea 9693, 11938
0000-0025	Radio Tirana, Albania..... 7065, 9760
0000-0030	BBC, England..... 5975, 6005 6120, 6175 7325, 9410 9515, 9590 9915, 12095 15435, 17710
0000-0030	KGEI, California..... 15280
0000-0030	Kol Israel..... 7410, 9435
0000-0030	Radio Berlin International.. 6080
0000-0030	Radio Canada International.. 5960, 9755
0000-0030	Radio Norway International.. 9570, 9605
0000-0050	Radio Pyongyang, North Korea 15140, 15160
0000-0100	Armed Forces Radio and TV.. 11790, 15330 17715, 17765 21570
0000-0100	All India Radio..... 9910, 11715
0000-0100	CBC Northern Quebec Svce... 9625
0000-0100	CFCX, Montreal, Canada..... 6005
0000-0100	CFRX, Toronto, Canada..... 6070
0000-0100	CFVP, Calgary, Canada..... 6030
0000-0100	CHNX, Halifax, Canada..... 6130
0000-0100	Christian Science Monitor... 7365
0000-0100	CKFX, Vancouver, Canada.... 6080
0000-0100	KCBI, Texas..... 11910
0000-0100	KSDA, Guam (AWR)..... 15115
0000-0100	KVOH, California..... 15250
0000-0100	KYOI, Saipan..... 15405
0000-0100	Radio Australia..... 15160, 15240 15320, 15395 17795
0000-0100	Radio Baghdad..... 11750
0000-0100	Radio Beijing, China..... 15445
0000-0100v	Radio Dublin International.. 6910
0000-0100	Radio Havana Cuba..... 6100, 9740
0000-0100	Radio Korea (South)..... 15575
0000-0100	Radio Moscow, U.S.S.R..... 7115, 7175 9600, 9720 9865, 11845 12030, 12060 12050, 13665 15265, 15425 17590, 17850
0000-0100	Radio Moscow World Service.. 7315, 9565
0000-0100	Radio Thailand..... 9655, 11845
0000-0100	Radio New Zealand Int'l... 11780, 15150
0000-0100	RTL Luxembourg..... 6090
0000-0100	Spanish Foreign Radio, Spain 6055, 9630
0000-0100	Voice of America..... 5995, 6130 9455, 9650 9775, 11580 11680, 11740 15185, 15205 15290, 15375 17740, 17820
0000-0100	WHRI, Indiana..... 11770

0100 UTC	[9:00 PM EDT/6:00 PM PDT]
0100-0115	All India Radio..... 6035, 7215 9595
0100-0115	Vatican Radio..... 11845
0100-0120	RAI, Italy..... 9575, 11800
0100-0125	BRT, Belgium..... 9830
0100-0125	Kol Israel..... 5885, 7410 9435
0100-0130	T-S Radio Budapest, Hungary.... 6025, 6110 9520, 9835 11910, 12000
0100-0130	Radio France International.. 15350
0100-0130	Radio Japan General Service. 7140, 9675
0100-0130	Radio Vientiane, Laos..... 15235, 17810 7112v
0100-0145	Radio New Zealand Int'l... 15150
0100-0145	WYFR, Florida..... 6065, 9680 11855
0100-0150	Deutsche Welle, West Germany 6040, 6085 6145, 9545 9565, 11785
0100-0200	ABC, Perth, Australia..... 15425
0100-0200	Armed Forces Radio and TV... 6030, 11790 15330, 17765 21570
0100-0200	BBC, England..... 5975, 6005 6120, 6175 7325, 9515 9590, 9755 9915, 11750
0100-0200	CBC Northern Quebec Svce... 9625
0100-0200	CFCX, Montreal, Canada..... 6005
0100-0200	CFRX, Toronto, Canada..... 6070
0100-0200	CFVP, Calgary, Canada..... 6030
0100-0200	CHNX, Halifax, Canada..... 6130
0100-0200	Christian Science Monitor... 7365
0100-0200	CKFX, Vancouver, Canada.... 6080
0100-0200	FEBC, Manila, Philippines.. 15315, 21475
0100-0200	HCJB, Ecuador..... 9870, 11910 15155
0100-0200	KCBI, Texas..... 11910
0100-0200	KSDA, Guam (AWR)..... 15115
0100-0200	KVOH, California..... 11930
0100-0200	KYOI, Saipan..... 15405
0100-0200	Radio Australia..... 9770, 15160 15240, 15320 15395, 17715 17750, 17795
0100-0200	Radio Baghdad, Iraq..... 11750
0100-0200	Radio Belize..... 3285
0100-0200	Radio Canada International.. 5960, 9755
0100-0200	Radio Cultural, Guatemala... 5955
0100-0200	R. Discovery, Dominican Rep. 6245v
0100-0200	Radio Budapest, Hungary.... 6110, 9835 12000
0100-0200v	Radio Dublin International.. 6910
0100-0200	Radio Havana Cuba..... 6100, 6190 9740

0100-0200	Radio Moscow.....	7115, 7175 7400, 9600 9765, 9865 11845, 12030 12050, 13665 15415, 15425 17850
0100-0200	Radio Moscow World Service..	7130, 7315 11720
0100-0200	Radio Prague, Czechoslovakia	5930, 7345 9540, 9740 11990
0100-0200	Radio Thailand.....	9655, 11905
0100-0200v	RAE, Argentina.....	9690, 11710
0100-0200	SBC Radio 1, Singapore.....	11940
0100-0200	Spanish Foreign Radio, Spain	6055, 9630
0100-0200	Sri Lanka Broadcasting Corp.	6005, 9720 15425
0100-0200	Voice of America.....	5995, 6080 6130, 9450 9650, 9770 11580, 11680 11740, 15200 15375
0100-0200	Voice of Indonesia.....	9680, 11790
0100-0200v	Voice of Nicaragua.....	6015v
0100-0200	WINB, Pennsylvania.....	15145
0100-0200	WHRI, Indiana.....	9680
0100-0200	WRNO Worldwide.....	7355
0115-0200	Radio Berlin International..	6080, 9730
0130-0140	Voice of Greece.....	7430, 9390 9420
0130-0200	Radio Austria International.	9770
0130-0200	Radio Tirana Albania.....	7120, 9760
0145-0200	Radio Berlin International..	6125, 6160
0145-0200	Radio Korea.....	6480, 7270
0200 UTC [10:00 PM EDT/7:00 PM PDT]		
0200-0215	Vatican Radio.....	6145, 7120 9650
0200-0225	Kol Israel.....	9435
0200-0225	Radio Netherland.....	6020, 9890
0200-0225	Radio Veritas, Philippines.	15195
0200-0230	BBC, England.....	5975, 6005 6120, 6175 7325, 9410 9515, 9590 9915, 11750
0200-0230	Burma Broadcasting Corp.....	7185
0200-0230	Radio Austria International.	6155
0200-0230 (T-A)	Radio Budapest, Hungary.....	6025, 9520 9835, 12000
0200-0230 (M-F)	Radio Canada International..	5960, 9755
0200-0230	Radio Kiev, Ukrainian SSR...	7175, 9605 11875, 13600
0200-0230	Radio Korea World.....	7275, 11810
0200-0230	SLBC, Sri Lanka.....	9720, 15425
0200-0230	Swiss Radio International...	6135, 9770 9885, 11920 12035
0200-0230	Voice of Nicaragua.....	6015
0200-0230	WINB, Pennsylvania.....	15145
0200-0240	Radio Berlin International..	7125, 9500
0200-0250	Deutsche Welle, W. Germany..	6035, 7210 9650, 9680 11945
0200-0256	Radio RSA, South Africa.....	5980, 6005
0200-0300	ABC Perth, Australia.....	15425
0200-0300	Armed Forces Radio and TV...	6030, 11790 17765, 21570
0200-0300 (S)	CBC Northern Quebec Service.	6195
0200-0300 TEN	Christian Science Monitor...	9745
0200-0300	GBC, Guyana.....	5950
0200-0300	HCJB, Ecuador.....	6230, 9870
0200-0300	KCBI, Texas.....	11910
0200-0300 TES	KSDA, Guam (AWR).....	15115
0200-0300 TEN	KVOH, California.....	11930
0200-0300	KYOI, Saipan.....	15405
0200-0300	Radio Australia.....	15180, 15240 15395, 17750 17750, 17795
0200-0300	Radio Beijing, PR China.....	6015, 9605
0200-0300	Radio Belize.....	3285
0200-0300	Radio Bras, Brazil.....	11745
0200-0300	Radio Bucharest, Romania....	5990, 6100 9510, 9550 11810, 11920
0200-0300	Radio Cairo, Egypt.....	9475, 9605
0200-0300 (T-A)	Radio Canada International..	5960, 9755
0200-0300 TES	R. Discovery, Dominican Rep.	6245v
0200-0300	Radio Cairo, Egypt.....	9475, 9605
0200-0300 (T-S)	Radio Dublin International..	6910
0200-0300	Radio Havana Cuba.....	6100, 6190 9740
0200-0300	Radio Japan.....	11870, 15425 15195

The MT Monitoring Team

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Larry Miller, PA
Greg Jordan, NC

Midwest:

Rich Foerster, NE

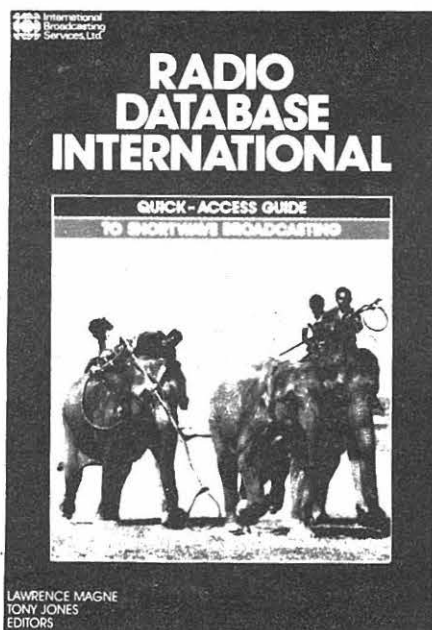
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SECTION

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frequency

SECTION

0500-0600 Spanish Foreign Radio..... 9630
 0500-0600 VLW 15, Lyndhurst, Australia 15230
 0500-0600 VLW 15, Waneroo, Australia 15425
 0500-0600 Voice of America..... 5995, 6035
 7170, 7200
 9575, 9670
 11925, 15205

0500-0600 Voice of Nicaragua..... 6015
 0500-0600 WHRI, Indiana..... 7400
 0500-0600v (M) World Music Radio..... 6910
 0500-0600 WRNO Worldwide..... 6185
 0530-0600 Radio Cameroon..... 4850
 0530-0600 Radio Netherland..... 6165, 9715
 0530-0600 UAE Radio, Dubai..... 15435, 17775
 17830, 21700

0600 UTC [2:00 AM EDT/11:00 PM PDT]

0600-0605 Radio Ghana..... 4915
 0600-0610 Voice of Kenya..... 6090
 0600-0625 Radio Netherland..... 6165, 9715
 0600-0630 AWR, Italy..... 6215
 0600-0630 Deutsche Welle..... 7290, 9625
 9700

0600-0700 Armed Forces Radio and TV... 6030, 15330
 17765
 0600-0700 BBC, London..... 5975, 6175
 7150, 9510
 9600, 9825
 9915, 12095
 15360

0600-0700 CFCX, Montreal, Canada..... 6005
 0600-0700 CFRX, Toronto, Canada..... 6070
 0600-0700 CFVP, Calgary, Canada..... 6030
 0600-0700 CKFX, Vancouver, Canada..... 6080
 0600-0700 CHNX, Halifax, Canada..... 6130
 0600-0700 TEN Christian Science Monitor... 7365
 0600-0700 GBC, Accra, Ghana..... 3366
 0600-0700 HCJB, Quito, Ecuador..... 6230, 9870
 11910

0600-0700 TEN King of Hope, Lebanon..... 6280
 0600-0700 KVOH, California..... 6005
 0600-0700 KYOI, Saipan..... 15190
 0600-0700 Radio Australia..... 15160, 15240
 15315, 17715
 17750

0600-0700 Radio Havana Cuba..... 9525
 0600-0700 Radio Moscow..... 9635, 9580
 9755, 11770
 11950, 13605
 13615, 13680
 15210, 17590
 17730, 17860
 17835, 17850
 17880

0600-0700 Radio Pyongyang, N. Korea.. 13650, 13680
 0600-0700 SBC Radio 1, Singapore..... 11940
 0600-0700 Solomon Islands Bcating Co. 5020
 0600-0700 VLQ 9, Brisbane, Australia.. 9660
 0600-0700 VLW 15, Lyndhurst, Australia 15230
 0600-0700 VLW 15, Waneroo, Australia. 15425
 0600-0700 Voice of America..... 3990, 5995
 6080, 6095
 6125, 9530
 9550, 9670
 7285
 6175, 9750
 15295

0600-0700 Voice of Asia, Taiwan..... 7285
 0600-0700 Voice of Malaysia..... 6175, 9750
 15295

0600-0700 WHRI, Indiana..... 6100
 0600-0700 (S) World Music Radio..... 6910
 0600-0700 (S) WRNO Worldwide..... 6185
 0600-0700 WYFR, Okeechobee, Florida... 6065, 6185
 7355, 7365
 9455

0615-0630 (M-F) Radio Canada International.. 6140, 7155
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 11775, 11840
 15235

0615-0630 (M-A) Vatican Radio..... 15190, 17730
 0625-0700 TWR, Monaco..... 7105
 0630-0655 Radio Netherland..... 9895, 11930
 0630-0700 Radio New Zealand Int'l... 11780
 0630-0700 Radio Polonia..... 6135, 7270
 9675
 5980, 7270
 9585, 11900
 9700, 11720
 15140

0630-0700 Radio RSA, South Africa..... 7080, 9500
 0630-0700 Radio Sofia, Bulgaria..... 3985, 6165
 9535, 9870
 12030, 15430
 6205

0630-0700 Radio Tirana..... 7080, 9500
 0630-0700 Swiss Radio International... 3985, 6165
 9535, 9870
 12030, 15430
 6205

0645-0700 (M-F) HCJB, Quito, Ecuador..... 11940, 15250
 0645-0700 Radio Bucharest, Romania... 15335, 17790
 17805, 21665

0700 UTC

0700-0712

0700-0725

0700-0730

0700-0730

0700-0730 (A,S)

0700-0730v

0700-0735

0700-0745

0700-0745

0700-0750

0700-0800

0700-0800

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[3:00 AM EDT/12:00 AM PDT]

Radio Bucharest, Romania... 11940, 15250
 15335, 17790
 17805, 21665
 9500, 11985
 9730
 5975, 6175
 7150, 9510
 15360
 9535
 11880v
 6070
 11780, 15150
 6065, 7355
 7400, 9455
 9852.5
 11930, 13750
 15340
 9660
 9680
 15400
 6005
 6070
 6030
 6130
 6080
 11830
 11850, 15350
 3366
 6130, 9745
 9860, 9845
 6280
 6005
 9555
 15190
 4890
 15395, 17715
 17750
 7295
 9525
 9735, 11955
 15235, 17810
 17855
 9560
 7290, 17590
 17880
 9655, 11905
 5010, 11940
 5020
 4920
 5995, 6035
 6080, 6125
 9550, 9670
 11840
 5985
 6175, 9750
 15295
 15120, 15185
 17800
 9620
 6910
 6185
 11725, 15190
 15120, 17780
 7105
 5990, 6010
 6020, 6050
 7110, 7250
 9610, 11730
 11850, 11935
 9410, 9510
 12095, 15070
 11735, 15115
 6120, 11755
 15265
 9630, 9715
 11855, 17840
 21705

Radio Tirana Albania.....

Burma Broadcasting Corp.....

BBC, London.....

TWR, Bonaire.....

Radio Zambia.....

TWR Swaziland.....

Radio New Zealand Int'l....

WYFR, Florida.....

Radio Pyongyang.....

ABC Brisbane.....

ABC Lyndhurst.....

Armed Forces Radio and TV..

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CFRX, Toronto, Canada.....

CFVP, Calgary, Canada.....

CHNX, Halifax, Canada.....

CKFX, Vancouver, Canada.....

ELWA, Liberia.....

FEBC, Manila.....

GBC, Accra, Ghana.....

HCJB.....

King of Hope, Lebanon.....

KVOH, California.....

KNLS, Anchor Point, Alaska..

KYOI, Saipan.....

NBC, Papua New Guinea.....

Radio Australia.....

Radio Earth (via Milano)....

Radio Havana Cuba.....

Radio Japan General Service..

Radio Kuwait.....

Radio Moscow.....

Radio Thailand.....

SBC Radio 1, Singapore.....

Solomon Islands Bcating Svc

VLM4 Brisbane, Australia....

Voice of America.....

Voice of Free China.....

Voice of Malaysia.....

Voice of Nigeria.....

WHRI, Indiana.....

World Music Radio.....

WRNO Worldwide.....

Vatican Radio.....

FEBA Radio, Seychelles....

TWR Monte Carlo.....

All India Radio.....

BBC, London.....

KTWR, Guam.....

Radio Finland.....

Radio Netherlands.....

Radio Prague.....

Radio Bangladesh.....

HCJB, Quito, Ecuador.....

Voice of Nigeria.....

FEBA, Seychelles.....

BRT, Belgium.....

AFAN, Antarctica.....

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CFCX, Montreal, Canada.....

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CFVP, Calgary, Canada.....

CHNX, Halifax, Canada.....

CKFX, Vancouver, Canada.....

0800-0900 (S,A) FEBC, Manila.....
 0800-0900 GBC, Accra, Ghana.....
 0800-0900 HCJB, Quito, Ecuador.....
 0800-0900 King of Hope, Lebanon.....
 0800-0900 KNLS, Anchor Point, Alaska.
 0800-0900 KTWR, Guam.....
 0800-0900 KYOI, Saipan.....
 0800-0900 Radio Australia.....

11890, 21475
 3366
 6130, 9745
 6280
 11860
 11735
 15190
 5995, 9580
 15395, 11720
 17715, 17750

0800-0900 Radio Earth (via Milan)....
 0800-0900 Radio Korea World News Svc..
 0800-0900 Radio Kuwait.....
 0800-0900 (S) Radio Prague.....

7295
 7275
 9750
 6055, 9505
 11990
 11830, 13680
 9670
 5010, 11940
 7105
 11790, 15150
 7355
 6185
 6000, 6155
 11915, 15410
 9700, 11755
 15440
 11855, 17840
 21705

0800-0900 Radio Pyongyang, N. Korea..

0800-0900 RTE Portugal.....

0800-0900 SBC Radio 1, Singapore.....

0800-0900 TWR Monte Carlo.....

0800-0900 Voice of Indonesia.....

0800-0900 WHRI, Indiana.....

0800-0900 (S) WRNO Worldwide.....

0830-0900 Radio Austria Int'l.....

0830-0900 Radio Beijing.....

0830-0900 Radio Prague, Czechoslovakia

0830-0840 All India Radio.....

0830-0855 (M-A) Radio Netherlands.....

0830-0900 HCJB, Quito, Ecuador.....

0830-0900 Radio Netherlands.....

0830-0900 Swiss Radio International..

0840-0900 Radio Australia.....

0847-0852 (A) R. Pacific Ocean, Vladivost.

0847-0852 (A) R. Pacific Ocean, Vladivost.

0847-0852 (A) R. Pacific Ocean, Vladivost.

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0847-0852 (A) R. Pacific Ocean, Vladivost.

0847-0852 (A) R. Pacific Ocean, Vladivost.

frequency

SECTION

1000-1100	AFRTS.....	6030, 6125 9530, 9590 9700, 11805	1100-1200	Radio New Zealand.....	15135, 15150 15475, 15550 6100, 9600	1300-1300	Radio Canada International.	9715, 11 11855, 17 15440, 17
1000-1100	All India Radio.....	11705, 11810 15320, 15335 17387, 17875	1100-1200	Radio Pyongyang, N. Korea...	9750, 9977	1300-1330	BBC, London.....	5965, 6 9410, 9 9750, 11
1000-1100	BBC, London.....	6195, 9410 9740, 9760 11750, 12095 15070, 15280 21660	1100-1200	SBC Radio 1, Singapore.....	5052, 11940	1300-1330	Radio Australia.....	6080, 7 9580, 7
1000-1100	B.S. Kingdom Saudi Arabia..	11855v	1100-1200	Trans World Radio Bonaire...	11815	1300-1330	Radio Bucharest, Romania...	9690, 11
1000-1100	CFCX, Montreal, Canada.....	6005	1100-1200	Voice of Asia, Taiwan.....	5980, 7445	1300-1330	Radio Finland.....	15400, 17
1000-1100	CFRX, Toronto, Canada.....	6070	1100-1200	Voice of Nigeria.....	7255, 15120	1300-1330	Radio Korea.....	6135
1000-1100	CFVP, Calgary, Canada.....	6030	1100-1200	WHRI, Indiana.....	5995	1300-1330 (S)	Radio Norway International.	6040, 15
1000-1100	CHNX, Halifax, Canada.....	6130	1100-1200 (S)	WRNO Worldwide.....	6185	1300-1337 (A-S)	TWR, Bonaire.....	15310, 17
1000-1100	CKFX, Vancouver, Canada.....	6080	1115-1130	Vatican Radio.....	17840, 21485	1300-1355 (A-S)	BRT, Belgium.....	11815
1000-1100	FEN, Japan.....	3910, 6155	1115-1200	Voice of Islamic Rep. Iran.	15084	1300-1355 (S)	Radio Finland.....	11945, 15
1000-1100	HCJB, Quito, Ecuador.....	6130, 11925	1130-1200	Radio Australia.....	5995, 6060 6080, 7215 9580, 9645 9710, 9770	1300-1400	4VEH, Haiti.....	4930
1000-1100	KNLS, Alaska.....	11930	1130-1200	Radio Netherland.....	11800 5955, 9715 15560, 17575 17605, 21480	1300-1400	AFRTS.....	9700, 15
1000-1100	Radio Dubai, UAE.....	17775	1130-1200	Radio Thailand.....	9655, 11905	1300-1400	B.S. Kingdom Saudi Arabia..	11855v
1000-1100	Radio Honaire, Solomon Is..	5020	1130-1200 (M-F)	TWR Bonaire.....	11815	1300-1400	CBC Northern Quebec Service	11720
1000-1100	Radio Moscow.....	9600, 9795 13645, 13665 13680, 13705 15110, 15140 15155, 15225 15265, 15490 17625, 17645 17665, 17775	1150-1200	Radio Budapest Hungary.....	6025, 9585 9835, 11910 15160, 17710	1300-1400	CFRX, Montreal, Canada.....	6005
1000-1100	Radio New Zealand Int'l.....	9600, 11780	1200 UTC			1300-1400	CFVP, Calgary, Canada.....	6030
1000-1100 (S)	Radio Prague.....	6055, 9505 11990	1200-1215			1300-1400	CHNX, Halifax, Canada.....	6130
1000-1100	SBC Radio 1, Singapore.....	5052, 11940	1200-1215 (M-A)	Radio New Zealand.....	6100, 9620	1300-1400	CKFX, Vancouver, Canada.....	6080
1000-1100	Voice of Nigeria.....	7255, 15120	1200-1215 (S)	Vatican Radio.....	15190, 17840 17865, 21485	1300-1400	FEBC, Manila.....	11850
1000-1100 (S)	WHRI, Indiana.....	7355	1200-1215	Voice of Islamic Rep. Iran.	15084	1300-1400	GBC, Accra, Ghana.....	7295
1000-1100	WRNO Worldwide.....	6185	1200-1215	Vatican Radio.....	17840, 21485	1300-1400	HCJB, Quito, Ecuador.....	11740, 15
1005-1010	Radio Pakistan.....	15605, 17660	1200-1215	Voice of People of Kampuchea	9693, 11938	1300-1400	KTWR, Guam.....	9870
1030-1040	Voice of Asia, Taiwan.....	5980	1200-1215	Radio Finland.....	11945, 15400	1300-1400	Radio Australia.....	5995, 6 7205, 9
1030-1100	Radio Austria International.	9625, 12025	1200-1225	Radio Bucharest, Romania...	9530, 11740	1300-1400	Radio Beijing.....	9550, 9
1030-1100	Radio Budapest Hungary.....	9835, 11910 15160, 15220 17710, 21665	1200-1225	Radio Netherland.....	5955, 9715 15560, 17575 17605, 21480	1300-1400	Radio Canada International.	11955, 17
1030-1100	Radio Netherland.....	6020, 9650	1200-1225	Radio Polonia.....	6095, 7285	1300-1400	Radio Moscow.....	9580, 9 9705, 9 11675, 13
1030-1000	Radio New Zealand.....	6100, 9620	1200-1230	Radio Tashkent.....	7325, 9600	1300-1400	Radio RSA, South Africa...	15220, 21
1030-1100	Sri Lanka Broadcasting Corp	11835, 15120	1200-1230	Radio Ulan Bator, Mongolia..	9615, 12015	1300-1400	SBC Radio 1, Singapore.....	5010, 11
1030-1100	UAE Radio, Dubai.....	17775, 17865	1200-1235	Swiss Radio International...	6165, 9535	1300-1400	Sri Lanka Broadcasting Corp.	6075, 9
1040-1050	Vatican Radio.....	21605, 21700 6250, 9645 11740	1200-1242	Radio Ulan Bator Mongolia..	12030	1300-1400	Voice of Nigeria.....	7255, 15
1040-1050	Voice of Greece.....	15630, 17565	1200-1250	Trans World Radio Bonaire..	11815	1300-1400 (S)	WHRI, Indiana.....	11790
1045-1000	Radio Nepal.....	5005, 9590	1200-1300	Radio Pyongyang, N. Korea...	9550	1300-1400	WRNO Worldwide.....	9715
1050-1100 (M-F)	Radio Budapest Hungary.....	9585, 9835 11910, 15160 17710	1200-1300	4VEH, Haiti.....	4930	1330-1400	All India Radio.....	11810, 15
1100 UTC	[7:00 AM EDT/4:00 AM PDT]		1200-1300	AFRTS.....	6030, 9700 15330, 15430 21670	1330-1400	Laotian National Radio.....	7123v
1100-1115	Radio Pakistan.....	15605, 17660	1200-1300	BBC, London.....	5965, 6195 9740, 11750 12095, 12095 15070	1330-1400	BBC, London.....	9740, 11
1100-1125	Radio Netherland.....	6020, 9650	1200-1300	B.S. Kingdom Saudi Arabia..	11855v	1330-1400	Radio Korea World News Svc.	12095, 15
1100-1130	Kol Israel.....	11605, 15560, 15643	1200-1300	CBC Northern Quebec Service.	6065, 9625	1330-1400	Radio Tashkent.....	15575
1100-1130	Radio Australia.....	5995, 6080 7215, 9580 9710, 9770	1200-1300	CFRX, Montreal, Canada.....	6005	1330-1400	Radio Tashkent.....	15460
1100-1130	Radio Finland.....	11945, 15400	1200-1300	CFRX, Toronto, Canada.....	6070	1330-1400	Swiss Radio International..	15570, 15
1100-1200	Radio Japan General Service.	9675, 11815	1200-1300	CFVP, Calgary, Canada.....	6030	1330-1400	U.A.E. Radio.....	1785, 17
1100-1130	Radio Sweden Int'l.....	9630, 15115	1200-1300	CHNX, Halifax, Canada.....	6130	1330-1400	U.A.E. Radio.....	11955, 17
1100-1130	Sri Lanka Broadcasting Corp	11835, 15120 17850	1200-1300	CKFX, Vancouver, Canada.....	6080	1330-1400	Voice of Vietnam.....	21605, 21
1100-1130	Swiss Radio International..	11795, 15570 15585, 17830	1200-1300	GBC, Accra, Ghana.....	7295	1330-1400	Radio Austria International	11935
1100-1130	Voice of America.....	6110, 9760 15160, 15210 15425	1200-1300	HCJB, Quito, Ecuador.....	11740, 15115 17890	1330-1400 (A)	WYFR, Florida.....	15055
1100-1130	Voice of Vietnam.....	9840, 12035	1200-1300	KYOI, Saipan.....	11900	1337-1400	TWR, Bonaire.....	11815
1100-1156	Radio RSA, South Africa....	11900, 15220	1200-1300	Radio Australia.....	5995, 6045 6060, 6080 7205, 9580 9770	1345-1400	Vatican Radio.....	7250, 9 11740
1100-1200	4VEH, Haiti.....	4930	1200-1300	Radio Beijing.....	9535, 9640	1400 UTC		
1100-1200	ABC, Brisbane, Australia....	4920	1200-1300	Radio Korea World News Svc..	7275	1400-1415	GBC, Accra, Ghana.....	7295
1100-1200	ABC, Perth, Australia.....	9610	1200-1300	Radio Moscow.....	9600, 9795	1400-1415	U.A.E. Radio, Dubai.....	11955, 17
1100-1200	AFRTS.....	6030, 9590 9700, 11805 15430	1200-1300 (S)	Radio Tanzania.....	9685	1400-1430	Radio Australia.....	5995, 6 6045, 6 6080, 9
1100-1200	BBC, London.....	5965, 6195 9410, 9510 9740, 11750 11775, 12095 15070, 15280	1210-1300	RAE, Argentina.....	15345	1400-1430 (S)	Radio Finland.....	15400, 17
1100-1200	B.S. Kingdom Saudi Arabia..	11855v	1215-1300	SBC Radio 1, Singapore.....	5010, 11940	1400-1430	Radio Japan General Service.	5990, 7
1100-1200	CFCX, Montreal, Canada.....	6005	1215-1245	Voice of America.....	6110, 9760	1400-1430	Radio Norway International.	9695, 11
1100-1200	CFRX, Toronto, Canada.....	6070	1230-1235	WHRI, Indiana.....	5995	1400-1500	Radio Polonia.....	6095, 7
1100-1200	CFVP, Calgary, Canada.....	6030		WRNO Worldwide.....	9715	1400-1500	Radio Sweden International.	11785, 15
1100-1200	CHNX, Halifax, Canada.....	6130		WYFR, Louisiana.....	5985, 11875	1400-1500	Radio Tirana.....	9500, 11
1100-1200	CKFX, Vancouver, Canada.....	6080		Voice of Nigeria.....	7255, 15120	1400-1500	ARFTS.....	9700, 11
1100-1200	Radio Beijing.....	9535		Radio Cairo.....	17675	1400-1500	All India Radio.....	11810, 15
1100-1200	Radio Korea.....	7275, 15575		Radio Japan Regional Serv..	11875, 15235	1400-1500	BBC, London.....	11570, 12
1100-1200	Radio Moscow.....	9600, 9795 11675, 13665 13680, 13705		Radio Berlin International.	21465, 21540	1400-1500	CBC Northern Quebec Service.	9625, 11
				All India Radio.....	3905, 4800 4920, 7280 9565, 9615 11620, 15245 6000, 6155 11915, 11955	1400-1500	CFRX, Montreal, Canada.....	6005
				Radio Austria International.	15525	1400-1500	CFRX, Toronto, Canada.....	6070
				Radio Bangladesh.....	9525, 9675	1400-1500	CFVP, Calgary, Canada.....	6030
				Radio Polonia.....	11840, 15120	1400-1500	CHNX, Halifax, Canada.....	6130
				Radio Sweden Int'l.....	9565, 11940	1400-1500	CKFX, Vancouver, Canada.....	6080
				Radio Tirana.....	9555, 11960	1400-1500 (S)	FEBC, Manila.....	9670
				Sri Lanka Broadcasting Corp.	6075, 9720 15425	1400-1500	HCJB, Quito, Ecuador.....	15115, 17
							KVOH, California.....	11940
							Radio Beijing.....	11600, 15
							Radio Canada International.	11955, 17
							Radio Korea, South.....	9570, 9
								15575

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1400-1500	Radio Moscow.....	9655, 11710 11840, 11850 12005, 12030 15100, 15125 15150, 15330 15455, 15475 17700, 17875	1600 UTC 1600-1605 1600-1615
1400-1500	Radio RSA, South Africa.....	9585, 15220 21535	1600-1630
1400-1500	SBC Radio 1, Singapore.....	5010, 11940	1600-1630 (S)
1400-1500	Sri Lanka Broadcasting Corp.	6075, 9720 15425	1600-1630 (S)
1400-1500	WHRI, Indianapolis.....	11790	1600-1630
1400-1500 (S)	WRNO Worldwide.....	11965	1600-1630 (M-F)
1400-1500	Voice of Nigeria.....	7255, 15120	1600-1630
1415-1430	KTRW, Guam.....	9820	1600-1630
1415-1500 (S,A)	GBC, Accra, Ghana.....	7295	1600-1645
1415-1500	Radio Berlin Int'l.....	11795, 15445 17700	1600-1645
1430-1445	Vatican Radio.....	11865, 15115 17845	1600-1700
1430-1500	Radio Australia.....	5995, 6045 6060, 6035 6080, 7205 9580, 9710	1600-1700
1430-1500 (M-A)	Radio Budapest Hungary.....	9835, 11910 15160, 15220 17710, 21665	1600-1700 (A)
1430-1500	Radio Korea World News Svc..	7275, 11805	1600-1700
1430-1500	Radio Netherland.....	5955, 11735 13770, 15560 17575	1600-1700
1430-1500	Radio Yugoslavia.....	9620, 15240	1600-1700
1445-1500	Radio Ulan Bator, Mongolia..	9575	1600-1700
1500 UTC	[11:00 AM EDT/8:00 AM PDT]		
1500-1520	Radio Ulan Bator Mongolia...	9615, 12015	1600-1700
1500-1530	HCJB, Quito, Ecuador.....	11740, 15115 17890	1600-1700
1500-1530	Radio Austria International.	6000, 6155 12015, 15420	1600-1700
1500-1530	Radio Bucharest.....	11940, 15250 15335	1600-1700
1500-1530	Radio Netherland.....	5955, 11735 13770, 15560 17575	1600-1700
1500-1530	Radio Veritas, Philippines..	9570	1600-1700
1500-1530	TWR, Guam.....	9870	1600-1700
1500-1530	Voice of Nigeria.....	7255, 11770	1600-1700
1500-1556	Radio RSA, South Africa.....	7270, 15220 17780	1600-1700
1500-1600	AFRTS.....	9700, 15330 15430	1600-1700
1500-1600	BBC, London.....	6195, 9410 9760, 11750 11775, 12095 15070, 15260 21660	1600-1700
1500-1600	CBC Northern Quebec Service.	9625, 11720	1600-1700
1500-1600	CFCX, Montreal, Canada.....	6005	1600-1700
1500-1600	CFRX, Toronto, Canada.....	6070	1600-1700
1500-1600	CFVP, Calgary, Canada.....	6030	1600-1700
1500-1600	CKFX, Vancouver, Canada.....	6080	1600-1700
1500-1600	CHNX, Halifax, Canada.....	6130	1600-1700
1500-1600	FEBC, Manila.....	9670	1600-1700
1500-1600	KVOH, California.....	11940	1600-1700
1500-1600	Radio Australia.....	5995, 6060 6080, 6035 7205, 9580 5990, 11815 15310	1600-1700
1500-1600	Radio Japan General Service.	5900, 5050 5980, 6020 6050, 9580 9655, 11840 11850, 11860 12055, 13680 13705, 15100 15125, 15150 15330	1600-1700
1500-1600	Radio Moscow.....	5900, 5050 5980, 6020 6050, 9580 9655, 11840 11850, 11860 12055, 13680 13705, 15100 15125, 15150 15330	1600-1700
1500-1600	RTM, Sarawak, Malaysia.....	4950	1700-1710
1500-1600	SBC Radio 1, Singapore.....	5052, 11940	1700-1715
1500-1600	Sri Lanka Broadcasting Corp.	6075, 9720 15425	1700-1715
1500-1600	Voice of Indonesia.....	11790, 15150	1700-1730
1500-1600	V. Revolutionary Ethiopia..	9560	1700-1730
1500-1600	WHRI, Indiana.....	15105	1700-1730
1500-1600	WRNO Worldwide.....	11965	1700-1730
1530-1545	Radio Bangladesh.....	7195	1700-1730
1530-1600 (M-A)	Radio Budapest Hungary.....	9835, 11910 15160, 15220 17710, 21665 7255, 11770 9620, 15240 11645, 15630 17565	1700-1730
1530-1600	Voice of Nigeria.....	7255, 11770	1700-1730
1530-1600	Radio Yugoslavia.....	9620, 15240	1700-1730
1540-1550	Voice of Greece.....	11645, 15630 17565	1700-1800
1545-1600	Vatican Radio.....	11810, 15120 17730	1700-1800

[12:00 PM EDT/9:00 AM PDT]

SBC Radio 1, Singapore.....	11940	1700-1800
Radio Pakistan.....	9645, 11675 11735, 11925 15515, 15595 17660	1700-1800
Radio Budapest Hungary.....	7220, 9585 9835, 11910 12000	1700-1800
Radio Norway International..	9510, 11925 17840	1700-1800
Radio Polonia.....	6135, 9540	1700-1800
Radio Portugal.....	15105, 15330	1700-1800
Radio Sweden Int'l.....	15110	1700-1800
Voice of Vietnam.....	10040, 15010	1700-1800
TWR, Swaziland.....	3200	1700-1800
UAE Radio, Dubai.....	9550, 11955 15300, 15320 9700, 11805 15330, 15430 7105, 9740 9515, 11775 12095, 15070 15260	1700-1800
AFRTS.....	11855v	1700-1800
BBC, London.....	9625, 11720 6005 6130 6070 6030 6080 11940 9665 6035, 6060 6080, 9550 9580, 15320 9570, 11600 11955, 17820 6175, 11705 17620, 17795 9560 5975, 9870 11810 3380, 5995 5920, 6020 9640, 9580 9655, 9755 11840, 15535	1700-1800
B.S. Kingdom Saudi Arabia..	11855v	1700-1800
CBC Northern Quebec Service.	9625, 11720	1700-1800
CFCX, Montreal, Canada.....	6005	1700-1800
CHNX, Halifax, Canada.....	6130	1700-1800
CFRX, Toronto, Canada.....	6070	1700-1800
CFVP, Calgary, Canada.....	6030	1700-1800
CKFX, Vancouver, Canada.....	6080	1700-1800
KVOH, California.....	11940	1700-1800
KYOI, Saipan.....	9665	1700-1800
Radio Australia.....	6035, 6060 6080, 9550 9580, 15320 9570, 11600 11955, 17820 6175, 11705 17620, 17795 9560 5975, 9870 11810 3380, 5995 5920, 6020 9640, 9580 9655, 9755 11840, 15535	1700-1800
Radio Beijing.....	9570, 11600	1700-1800
Radio Canada International.	11955, 17820	1700-1800
Radio France International..	6175, 11705 17620, 17795 9560 5975, 9870 11810 3380, 5995 5920, 6020 9640, 9580 9655, 9755 11840, 15535	1700-1800
Radio Jordan.....	9560	1700-1800
Radio Korea.....	5975, 9870	1700-1800
Radio Malawi.....	11810	1700-1800
Radio Moscow.....	3380, 5995 5920, 6020 9640, 9580 9655, 9755 11840, 15535	1700-1800
Radio Riyadh, Saudi Arabia..	9720v	1700-1800
Radio Tanzania.....	6105	1700-1800
Radio Zambia.....	9505	1700-1800
UAE Radio.....	9550, 15320	1700-1800
Voice of America.....	6110, 11920 15205, 15410 15445, 15580 15600, 17785 17800, 17870 7255, 11770 15105 11965 11830, 11875 17845 4820, 7255 3205 11965 11830 7245, 9535 11955 6020, 9515 11690, 11755 11865, 12045 13660, 15140 7125, 9525 15255 9535, 11830 6230, 9465 15566, 17640 21525	1700-1800
Voice of Nigeria.....	6110, 11920 15205, 15410 15445, 15580 15600, 17785 17800, 17870 7255, 11770 15105 11965 11830, 11875 17845 4820, 7255 3205 11965 11830 7245, 9535 11955 6020, 9515 11690, 11755 11865, 12045 13660, 15140 7125, 9525 15255 9535, 11830 6230, 9465 15566, 17640 21525	1700-1800
WHRI, Indiana.....	15105	1700-1800
WRNO Worldwide.....	11965	1700-1800
WYFR, Florida.....	11830, 11875 17845 4820, 7255 3205 11965 11830 7245, 9535 11955 6020, 9515 11690, 11755 11865, 12045 13660, 15140 7125, 9525 15255 9535, 11830 6230, 9465 15566, 17640 21525	1700-1800
Radio Botswana.....	4820, 7255	1700-1800
Radio Belem.....	3205	1700-1800
KNLS, Alaska.....	11965	1700-1800
ELWA, Liberia.....	11830	1700-1800
Radio Nacional Angola.....	7245, 9535 11955 6020, 9515 11690, 11755 11865, 12045 13660, 15140 7125, 9525 15255 9535, 11830 6230, 9465 15566, 17640 21525	1700-1800
Radio Netherland.....	6020, 9515 11690, 11755 11865, 12045 13660, 15140 7125, 9525 15255 9535, 11830 6230, 9465 15566, 17640 21525	1700-1800
R. Peace and Progress USSR.	11690, 11755 11865, 12045 13660, 15140 7125, 9525 15255 9535, 11830 6230, 9465 15566, 17640 21525	1700-1800
Radio Polonia.....	13660, 15140 7125, 9525 15255 9535, 11830 6230, 9465 15566, 17640 21525	1700-1800
Voice of Africa, Egypt.....	15255	1700-1800
WYFR, Florida.....	9535, 11830 6230, 9465 15566, 17640 21525	1700-1800
Radio Pakistan.....	6230, 9465 15566, 17640 21525	1700-1800
WYFR, Florida.....	15566, 17640 21525	1700-1800
Voice of Lebanon.....	6548	1700-1800
Kol Israel.....	9920, 11585 13745 6020, 9515 9740, 15070 15260 6035, 6060 7205 5990, 11815 9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Radio Netherland.....	6020, 9515 9740, 15070 15260 6035, 6060 7205 5990, 11815 9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
BBC, England.....	9740, 15070 15260 6035, 6060 7205 5990, 11815 9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Radio Australia.....	6035, 6060 7205 5990, 11815 9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Radio Japan.....	5990, 11815 9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Radio Norway International..	9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Radio Portugal.....	15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Swiss Radio International...	3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
4VEH, Haiti.....	9700, 15330 15345, 15430	1700-1800
AFRTS.....	9700, 15330 15345, 15430	1700-1800
CBC, N. Quebec, Canada.....	11720	1700-1800
CFCX, Montreal, Canada.....	6005	1700-1800
CFRX, Toronto, Canada.....	6070	1700-1800

[1:00 PM EDT/10:00 AM PDT]

Voice of Lebanon.....	6548	1700-1800
Kol Israel.....	9920, 11585 13745 6020, 9515 9740, 15070 15260 6035, 6060 7205 5990, 11815 9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Radio Netherland.....	6020, 9515 9740, 15070 15260 6035, 6060 7205 5990, 11815 9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
BBC, England.....	9740, 15070 15260 6035, 6060 7205 5990, 11815 9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Radio Australia.....	6035, 6060 7205 5990, 11815 9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Radio Japan.....	5990, 11815 9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Radio Norway International..	9655, 11925 15310 15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Radio Portugal.....	15250 3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
Swiss Radio International...	3985, 6165 9535 4930 9700, 15330 15345, 15430	1700-1800
4VEH, Haiti.....	9700, 15330 15345, 15430	1700-1800
AFRTS.....	9700, 15330 15345, 15430	1700-1800
CBC, N. Quebec, Canada.....	11720	1700-1800
CFCX, Montreal, Canada.....	6005	1700-1800
CFRX, Toronto, Canada.....	6070	1700-1800

1700-1800		CFVP, Calgary, Canada.....	6030	
1700-1800		CHNX, Halifax, Canada.....	6130	
1700-1800		CKFX, Vancouver, Canada.....	6080	
1700-1800		CKZU, Vancouver, Canada.....	6160	
1700-1800	(S)	KCBI, Texas.....	11735	
1700-1800		KNLS, Alaska.....	11965	
1700-1800	TEN	KVOH, California.....	17775	
1700-1800		KYOI, Saipan.....	9665	
1700-1800		Radio Beijing.....	9570,	11600
1700-1800		Radio Korea, South.....	5975,	15575
1700-1800		Radio Moscow.....	5920,	6020
			9580,	9605
			9640,	9705
			9755,	9885
			11840,	11865
			12030,	15500
1700-1800		Radio Nacional Angola.....	7245,	9535
			11955	
1700-1800		Radio Portugal.....	15250	
1700-1800		Radio Pyonyang, N. Korea....	7105,	7305
			9977,	11665
1700-1800		Radio Riyadh, Saudi Arabia..	9720v	
1700-1800		Radio Tanzania.....	6105	
1700-1800		Radio Zambia.....	9505	
1700-1800		Voice of Africa, Egypt.....	15255	
1700-1800		Voice of America.....	6110,	11920
			15410,	15445
			15580,	15600
1700-1800		Voice of Nigeria.....	11770	
1700-1800		WHRI, Indiana.....	15105	
1700-1800		WINB, Pennsylvania.....	15295	
1700-1800	TEST	WMLK, Pennsylvania.....	15110	
1700-1800		WRNO Worldwide.....	11965	
1700-1800		WYFR, Florida.....	9535,	11830
			11875	
1730-1745		BBC.....	15070	
1730-1800		Radio Australia.....	6035,	9580
1730-1800		Radio Bucharest, Romania....	7145,	9640
			9690,	11830
1730-1800		Radio Polonia.....	6135,	9540
1730-1800		Radio Prague, Czechoslovakia	5930,	7345
			9605,	11990
			13605,	15110
			17705,	21505
1730-1800		Radio Surinam.....	17755	
1730-1800		Spanish Foreign Radio.....	6020,	7275
			9765	
1745-1800		BBC, London.....	9410,	11745
			12095,	15070
			15400	
1730-1800		Radio Sofia, Bulgaria.....	11735,	11840
			15310	
1800 UTC		[2:00 PM EDT/11:00 AM PDT]		
1800-1810		Voice of Kenya.....	6135	
1800-1815		Radio Cameroon.....	4750,	4795
			4850,	5010
			9745	
1800-1830		AWR, Italy.....	6205	
1800-1830		Radio Canada International.	15260,	17820
1800-1830		Radio Japan.....	7250,	9675
1800-1830		Radio Kiev.....	7175,	7330
			9560,	9710
1800-1830		Radio Mozambique.....	3340,	9620
1800-1830	(M-F)	Radio Portugal.....	15250	
1800-1830		TWR, Monte Carlo.....	11965	
1800-1900		Voice of Africa, Egypt.....	15255	
1800-1830		Voice of Vietnam.....	10040,	15010
1800-1900		Deutsche Welle.....	7285,	9700
			9735,	11785
1800-1850		Radio Nacional do Brasil...	15155	
1800-1855	(M-A)	BRT Brussels, Belgium.....	5910,	15510
1800-1900		4VEH, Haiti.....	4930	
1800-1900		AFRTS.....	15330,	15345
			15430,	17765
1800-1900		All India Radio.....	11940,	15280
1800-1900		BBC, London.....	7325,	9410
			12095,	15070
1800-1900		CBC, N. Quebec Service....	11720	
1800-1900		CFCX, Montreal, Canada.....	6005	
1800-1900		CFRX, Toronto, Canada.....	6070	
1800-1900		CFVP, Calgary, Canada.....	6030	
1800-1900		CKFX, Vancouver, Canada.....	6080	
1800-1900		CKZU, Vancouver.....	6160	
1800-1900		KCBI, Dallas.....	11735	
1800-1900		KNLS, Alaska.....	11965	
1800-1900	TEN	KVOH, California.....	17775	
1800-1900		KYOI, Saipan.....	9665	
1800-1900		Radio Australia.....	5995,	6045
			6060,	6035
			6080,	7215
			9580	
1800-1900	(A,S)	Radio Canada International.	15260,	17820
1800-1900	TEST	R. Discovery, Dominican Rep	15045	
1800-1800v		Radio Jamahiriya, Libya....	15450v	
1800-1900		Radio Korea.....	5975,	15575
1800-1900		Radio Kuwait.....	11675	
1830-1900		Radio New Zealand Int'l....	11780,	15150
1800-1900		Radio Moscow.....	6020,	9580
			9640,	11860
			11865,	12070
			12050,	12030
1800-1900		Radio Riyadh, Saudi Arabia..	9720v	
1800-1900		Radio Tanzania.....	6105	
1800-1900		Radio Zambia.....	9505	
1800-1900		RAE, Argentina.....	15435	
1800-1900		TWR, Swaziland.....	9550	
1800-1900		Voice of America.....	15445,	15580
			15410,	17785
			17800	
1800-1900		Voice of Nigeria.....	11770,	15120
			17800	
1800-1900		WHRI, Indiana.....	15105	
1800-1900		WINB, Pennsylvania.....	15400	
1800-1900		WRNO Worldwide.....	15420	

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1800-1900	WYFR, Florida.....	9535, 11830
1805-1830 (A,S)	Radio Austria International.	11875
1814-1817	Radio Suriname Int'l.....	5945, 6000
1815-1900	Radio Bangladesh.....	17755
1815-1900	Radio Berlin International..	6240, 7505
1830-1855	Radio Finland.....	6080, 6115
		6120, 9655
1830-1900	Radio Netherlands.....	11755
		6020, 9540
1830-1900	Radio Polonia.....	17605, 21685
		5995, 6135
		7125, 7285
		9525, 9675
1830-19000	Radio Sweden International..	11840
		6065, 11835
1830-1900	Radio Sofia, Bulgaria.....	15240
		6070, 9700
1830-1900	Radio Sweden Int'l.....	11720
1830-1900	Radio Tirana.....	6065, 15240
1830-1900	Radio Togo, Lome.....	7065, 9480
1830-1900	Swiss Radio International...	9885, 11955
1830-1900	Radio Netherlands.....	6020, 9540
		17605, 21685
1830-1900	Spanish Foreign Radio.....	11840, 15375
1830-1900	Radio Abidjan, Ivory Coast.	11940
1830-1900	Radio Havana Cuba.....	11795
1830-1900	Radio New Zealand.....	11780, 15150
1840-1900	Voice of Greece.....	11645, 12105
		15630
1845-1900	All India Radio.....	7412, 11620
1900 UTC	[3:00 PM EDT/12:00 PM PDT]	
1900-1905	Vatican Radio.....	6190, 6250
		7250, 9645
1900-1915	Radio Bangladesh.....	9855, 11555
1900-1925	Radio Netherland.....	6020, 9540
		17605, 21685
1900-1925	Radio Prague, Czechoslovakia	5930, 7345
1900-1930	Kol' Israel.....	9009, 9440
		9435, 11655
		11700, 12027.5
		15425, 17685
1900-1930	KNLS, Alaska.....	17815
1900-1930 (M-F)	Radio Canada International..	7355, 11965
		5995, 7285
		15260, 15325
		17820, 17875
		21695
1900-1930	Radio Japan.....	9505
1900-1930	Radio Kiev, Ukrainian SSR...	7230, 6010
		6090, 6165
1900-1930 (S)	Radio Norway Int'l.....	11865, 15310
1900-1930	Voice of Vietnam.....	10040, 15010
1900-2000	4VEH, Haiti.....	4930
1900-2000	AFRTS.....	15330, 15345
		15430, 17765
1900-2000	All India Radio.....	7150, 9665
		11620, 11845
1900-2000	BBC, London.....	15265
		7325, 9410
		12095, 15070
1900-2000	B.S. Kingdom Saudi Arabia..	11855
1900-2000	CFCX, Montreal, Canada.....	6005
1900-2000	CFRX, Toronto, Canada.....	6070
1900-2000	CFVP, Calgary, Canada.....	6030
1900-2000	CKFX, Vancouver, Canada.....	6080
1900-2000	CKZU, Vancouver, Canada.....	6160
1900-2000	HCJB, Ecuador.....	15220, 15270
		17790
1900-2000	KCBI, Texas.....	11735
1900-2000	KVOH, California.....	17775
1900-2000	Radio Australia.....	5995, 6045
		6060, 6035
		6080, 7215
		9580
1900-2000	Radio Beijing.....	9860, 11500
1900-2000 (A,S)	Radio Canada International..	7130, 9555
		11945, 15325
1900-2000	TEST R. Discovery, Dominican Rep	17875
1900-2000	Radio Kuwait.....	15045
1900-2000	Radio Moscow.....	11675
		9580, 9730
		12030, 12050
		12070, 13665
		15480, 15500
1900-2000	Radio New Zealand Int'l....	11780, 15150
1900-2000	Voice of America.....	15410, 15580
		17785, 17800
1900-2000	Voice of Nigeria.....	7255, 11770
1900-2000	V. Revolution.....	9595
1900-2000	WHRI, Indiana.....	15105
1900-2000	WINB, Pennsylvania.....	15400
1900-2000	WRNO Worldwide.....	15420
1900-2000	WYFR.....	9535, 11830
		11875, 15170
		15566, 21615
1910-1920	Radio Botswana.....	3355, 4820
1920-1930 M-A	Voice of Greece.....	7430, 9395
		9420

1930-2000	Radio Beijing, China.....	9440, 11515
		11905
1930-2000	Radio Bucharest, Romania....	7145, 9690
		9750, 11940
1930-2000	Radio Finland.....	6120, 11755
1930-2000	Radio Tirana Albania.....	7075, 9500
1930-2000	Voice of Islamic Rep. Iran..	9022, 11930
1940-2000	Radio Ulan Bator Mongolia...	7235, 15305
1950-2000	Vatican Radio.....	6190, 7250
		9645
2000 UTC	[4:00 PM EDT/1:00 PM PDT]	
2000-2005	Radio Ghana.....	4915
2000-2005	Radio Ulan Bator Mongolia...	9575, 15305
2000-2010	Vatican Radio.....	6190, 7250
		9645
2000-2010	Voice of Kenya.....	4808
2000-2015 (M-F)	Radio Cotonou, Benin.....	4870
2000-2015	Radio Togo, Lome.....	3220, 5047
2000-2025	Radio Beijing, China.....	9440, 11515
		11905
2000-2025	Radio Bucharest, Romania....	7145, 9690
		9750, 11940
2000-2025 (M-H)	Radio Polonia.....	7125, 7145
		9525, 9695
2000-2030	Radio Australia.....	6060, 6035
		6045, 6080
		7215, 9580
		9620
2000-2030	Radio Algiers, Algeria.....	9640, 9685
		15160, 15215
2000-2030	Radio Budapest Hungary.....	17745
		6025, 7220
		9585, 9835
2000-2030 (M-F)	Radio Canada International..	11910, 12000
		7130, 9555
		11945, 15325
		17820, 17875
2000-2030 (S)	Radio Norway International..	6015, 11865
		15310
2000-2030	Radio Polonia.....	7125, 7145
		9525, 9675
2000-2030	Radio Prague, Czechoslovakia	5930, 7345
2000-2030	Voice of Islamic Rep. Iran..	9022, 11930
2000-2030	Voice of Nigeria.....	7255, 11770
2000-2045	All India Radio.....	7160, 9665
		9755, 9910
		11620, 11865
2000-2100	AFRTS.....	11805, 15330
		15345, 15430
		17765
2000-2100	BBC, London.....	6175, 9410
		11675, 12095
		15070, 15260
2000-2100	CBC Northern Quebec Service.	9625, 11720
2000-2100	CFCX, Montreal, Canada.....	6005
2000-2100	CFRX, Toronto, Canada.....	6070
2000-2100	CFVP, Calgary, Canada.....	6030
2000-2100	CHNX, Halifax, Canada.....	6130
2000-2100	CKFX, Vancouver, Canada.....	6080
2000-2100	CKZV, Canada.....	6160
2000-2100 (M-F)	KCBI, Texas.....	11735
2000-2100	King of Hope, Lebanon.....	6280
2000-2100	KVOH, California.....	17775
2000-2100	KYOI, Saipan.....	9670
2000-2100	Radio Kuwait.....	11675
2000-2100	Radio Moscow.....	11675, 11840
		12030, 12050
		13665, 13785
		15425
2000-2100	R. Nacional, Equator Guinea	15106
2000-2100	Radio New Zealand.....	11780, 15150
2000-2100	Radio Pyongyang, N. Korea...	6575, 7105
		9345, 9977
2000-2100	Radio Zambia.....	9505
2000-2100	Voice of America.....	15300, 15410
		15445, 15580
		17785, 17870
		7215
2000-2100	Voice of Turkey.....	15310
2000-2100 (S,A)	WHRI, Indiana.....	15185
2000-2100	WINB, Red Lion, Penna.....	15420
2000-2100	WRNO Worldwide.....	9530, 11830
		11875
		15170
2005-2100	Radio Damascus Syria.....	7455, 12085
2010-2100	Radio Havana Cuba.....	17885
2015-2100	ELWA, Liberia.....	11830
2015-2045	RAI, Italy.....	7235, 9575
		11800
2030-2100	Falkland Islands Bcast Svc..	2380 / 3958
2030-2100	IBRA Radio.....	6110
2030-2100	Radio Australia.....	6035, 6045
		6080, 7215
		9580, 9620
2030-2100	Radio Beijing.....	6955, 7480
		9440, 9895
2030-2100	Radio Canada International..	11945
2030-2100	Radio Netherland.....	9540, 9715
		9895, 11740

2030-2100	Radio Polonia.....	6095, 7285
2030-2100 (M-F)	Radio Portugal.....	9740, 11790
2030-2100	Radio Sofia, Bulgaria.....	9700
2030-2100	Radio Tirana, Albania.....	7065
2030-2100	Voice of Africa (Cairo)....	15375
2030-2100	Voice of Nigeria.....	11770
2030-2100	Voice of Vietnam.....	10040, 12020
		15010
2045-2100	All India Radio.....	7160, 9550
		9665, 9910
		11620, 11870
2045-2100	Vatican Radio.....	9625, 11700
		11760, 15120

2100 UTC	[5:00 PM EDT/2:00 PM PDT]	
2100-2105	Radio Damascus Syria.....	7455, 9950
2100-2115	Radio New Zealand Int'l....	11780, 15150
2100-2220	ELWA, Liberia.....	11830
2100-2125 (S-F)	CBC Northern Quebec Service.	9625, 11720
2100-2125	Radio Beijing.....	9440
2100-2125	Radio Netherland.....	9540, 9715
		9895, 11740
2100-2130	ELWA, Liberia.....	11830
2100-2130	Radio Finland.....	6120, 11755
2100-2130	Radio Australia.....	6080, 9580
		9620, 15160
		15395, 17795
2100-2130	Radio Bucharest, Romania....	6055, 7145
		7195, 9690
2100-2130	Radio Japan General Service.	7140, 9675
		11815
2100-2130	Radio Sweden International.	11845, 11955
2100-2140	Radio Havana Cuba.....	11725, 17885
2100-2150	Deutsche Welle, West Germany	6010, 7130
		9675, 9765
		11815
2100-2150	Radio Pyongyang, N. Korea...	6575, 9360
		11660
2100-2155	BRT, Brussels, Belgium.....	5910
2100-2156	Radio RSA, South Africa.....	7270, 9585
		11900
2100-2200	AFRTS.....	11805, 15330
		15345, 15365
		15430, 17765
2100-2200	All India Radio.....	7412, 9665
		9910, 11620
2100-2200	BBC, London.....	6175, 7325
		9410, 12095
		15070, 15260
2100-2200	CFCX, Montreal, Canada.....	6005
2100-2200	CFRX, Toronto, Canada.....	6070
2100-2200	CFVP, Calgary, Canada.....	6030
2100-2200	CHNX, Halifax, Canada.....	6130
2100-2200	CKFX, Vancouver, Canada.....	6080
2100-2200	Falkland Islands Bcast Svc..	2380 / 3958
2100-2200	KCBI, Texas.....	11735
2100-2200	King of Hope, Lebanon.....	6280
2100-2200	KVOH, California.....	17775
2100-2200	KYOI, Saipan.....	9670
2100-2200	Radio Baghdad, Iraq.....	7170
2100-2200 (M-F)	Radio Canada International..	11960, 15325
2100-2200v	Radio Jamahiriya, Libya.....	6155, 11815
2100-2200	Radio Moscow.....	12030, 12050
		11770, 11840
		11860, 15425
		9535, 7245
2100-2200 (M-A)	Radio Nacional Angola.....	15106
2100-2200	R. Nacional, Equat. Guinea.	9505
2100-2200 (F,A)	Radio Zambia.....	6090
2100-2200	RTL, Luxembourg.....	15375
2100-2200	Voice of Africa (Cairo)....	7445, 15375
2100-2200	Voice of America.....	9760, 11760
		15410, 15580
		17800
2100-2200	Voice of Free China,Taiwan.	17845
2100-2200	Voice of Nigeria.....	15120
2100-2200	Voice of Turkey.....	7215
2100-2200	WHRI, Indiana.....	9770
2100-2200	WRNO Worldwide.....	11705
2100-2200	WYFR, Okeechobee, Florida..	9535, 11830
		11875
2105-2200	Radio Damascus, Syria.....	9950, 12085
2115-2145	Radio Cairo.....	9805
2115-2200	Radio Yugoslavia.....	6100, 7240
		9620
2130-2200 (T,F)	BBC Falklands Service.....	9915, 11820
		12040, 15390
2130-2200 (S-F)	CBC Northern Quebec Service.	9625, 11720
		15270, 1779
2130-2200	HCJB, Quito, Ecuador.....	15280
2130-2200	KGEI, San Francisco, CA....	9009, 943
2130-2200	Kol Israel.....	9815, 986
		11960, 1208
		13725
2130-2200	Radio Austria International.	5945, 600
		9670
2130-2200	Radio Australia.....	15160, 1539
		17795
2130-2200	Radio Canada International..	11945, 1515
		17820
2130-2200	Radio Prague.....	6055
2130-2200	Radio Sofia, Bulgaria.....	11720, 1533
2130-2200	Radio Vilnius, Lithuania....	6100
2200 UTC	[6:00 PM EDT/3:00 PM PDT]	
2200-2205	Radio Damascus, Syria.....	9950, 1208
2200-2207	Voice of America.....	11740, 1516
		17730, 1771
2200-2210	Radio Sierra Leone.....	5980
2200-2225	Radio Tirana Albania.....	7065, 948
2200-2225	Radio Yugoslavia.....	6100, 967
2200-2225	RAI, Italy.....	9710, 1180
		15330

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2200-2230	All India Radio.....	7160, 9550 9665, 9910 11620, 11870
2200-2230 (S-F)	CBC Northern Quebec Service..	9625, 9755 11720
2200-2230 (S)	Radio Canada International..	5960, 9755
2200-2230	Radio Norway International..	9605, 11930
2200-2230	Radio Vilnius, Lithuania SSR	7165, 7400 9800, 11750 11860, 15100
2200-2245	Radio, Cairo, Egypt.....	9805
2200-2245	WINB, Red Lion, Penna.....	15185
2200-2250	Radio Jamahiriya, Libya.....	6155
2200-2250	Voice of Turkey.....	7215, 9535 9560, 17725
2200-2300	AFRTS.....	11790, 15330 15345, 17765 21570
2200-2300	BBC, London.....	5975, 6120 6170, 6175 7325, 9590 9515, 9915 12095, 15070
2200-2300	CFCX, Montreal, Canada.....	6005
2200-2300	CFRX, Toronto, Canada.....	6070
2200-2300	CFVP, Calgary, Canada.....	6030
2200-2300	CHNX, Halifax, Canada.....	6130
2200-2300	CKFX, Vancouver, Canada.....	6080
2200-2300	CKZU, Vancouver.....	6160
2200-2300	Falkland Islands Bcast Svc..	2380 / 3958
2200-2300	FEBC, Manila.....	15320
2200-2300	KVOH, California.....	15250
2200-2300	KYOI, Saipan.....	15405
2200-2300	Radio Australia.....	15160, 15240 15320, 15395 17725, 17795
2200-2300 (M-F)	Radio Canada International..	6170, 7230 11945, 15325
2200-2300	Radio Havana Cuba.....	11705
2200-2300	Radio Korea.....	6480, 7550
2200-2300	Radio Moscow.....	7400, 9490 9610, 9720 9820, 9880 11950, 12030 12050, 12060 13665, 15425 15478 LSB
2200-2300	Radio Sofia Bulgaria.....	15330
2200-2300	Spanish Foreign Radio.....	5960, 6020 7105
2200-2300	Voice of America.....	15185, 15290 15305, 15415 15580, 17740 17775, 17800 17820
2200-2300	Voice of Free China, Taiwan.	9955, 15440 17845
2200-2300	WHRI, Indiana.....	9770
2200-2300	WRNO Worldwide.....	9852.5
2200-2300	WYFR, Okeechobee, Florida..	11830, 11855 15055, 17750 21525
2205-2230	Vatican Radio.....	6015, 9615 11830
2215-2230	Radio Yugoslavia.....	6100, 7240 9620
2230-2300 (S)	CBC Northern Quebec Service.	9625, 11720
2230-2300	Kol Israel.....	7410, 9435 9815, 9860 11960, 12025
2230-2300	Radio Mediterran, Malta.....	6110
2230-2300 (S)	Radio Nacional Angola.....	7245, 9535
2230-2300	Radio Polonia.....	5995, 6135 7125, 7270
2230-2300	Swiss Radio International...	6190
2245-2300	All India Radio.....	6035, 7215 9595, 9912 11765
2130-2200	Swiss Radio International...	9590, 9885
2130-2200	WCJB.....	17795
2300 UTC	[7:00 PM EDT/4:00 PM PDT]	
2300-2330	BBC, London.....	5975, 6005 6120, 6175 7325, 9410 9590, 9915 12095, 15070 15435
2300-2330	Kol Israel.....	7410, 9435 9860
2300-2345	Radio Berlin Int'l.....	6080, 9730
2300-2330	Radio Canada International..	9755, 11710
2300-0000	Radio Japan General Service.	7140, 9645 9675, 11815 15235 9695, 11705
2300-2330	Radio Sweden International..	15400
2300-2345	WYFR, Okeechobee, Florida.	6105, 7215
2300-2350	Voice of Turkey.....	9560, 9730
2300-0000	4VEH, Haiti.....	4930

2300-0000	AFRTS.....	11790, 15330 15345, 17765 21570
2300-0000 (A)	CBC Northern Quebec Service.	9625, 11720
2300-0000	CFCX, Montreal, Canada.....	6005
2300-0000	CFRX, Toronto, Canada.....	6070
2300-0000	CFVP, Calgary, Canada.....	6030
2300-0000	CHNX, Halifax, Canada.....	6130
2300-0000	CKFX, Vancouver, Canada.....	6080
2300-0000	CKZU, Vancouver.....	6160
2300-0000	Falkland Islands Bcast Svc..	2380 / 3958
2300-0000	FEBC, Manila.....	15320
2300-0000	KVOH, California.....	15250
2300-0000	KYOI, Saipan.....	15405
2300-0000	Radio Australia.....	15160, 15240 15320, 15395 17725, 17795
2300-0000	Radio Clarin, Dominican R.	11700
2300-0000	Radio Japan.....	7140, 9645 9675, 11815 15235
2300-0000	Radio Kiev, Ukrain, USSR....	9640, 9665 9685, 9800 11790, 11875 13605 15575
2300-0000	Radio Korea, South.....	7115, 7175
2300-0000	Radio Moscow.....	7195, 7400 9610, 9720 9735, 9765 9865, 12030 12050, 12060 13665, 15425 17850 15478 LSB
2300-0000	Radio Prague, Czechoslovakia	6055, 9630
2300-0000	Radio Pyongyang, N. Korea..	11735, 13650
2300-0000	Radio Sofia Bulgaria.....	11720, 15330
2300-0000	Radio Thailand.....	9650, 11905
2300-0000	RTL, Luxembourg.....	6090
2300-0000	Voice of America.....	9640, 11740 15160, 15185 15290, 17730 17740, 17820 11775
2300-0000	WHRI, Indiana.....	9852.5
2300-0000	WRNO Worldwide.....	6300, 7485
2300-0000	WYFR, Florida.....	11830, 11855 5975, 6120 6175, 7325 9590, 9915 12095
2330-0000	BBC, London.....	
2330-0000 (S-F)	Radio Canada International..	5960, 9755
2330-0000	Voice of Vietnam.....	9840, 12035
2335-2345	Voice of Greece.....	9395, 11645
2345-0000	Radio Berlin Int'l.....	6080, 9730
2345-0000	Radio Korea, South.....	7275

Khadaffi's Repeater

The Libyan Air Defense Command is alerted by a UHF repeater system with dual-channel receivers which was manufactured in the United States in July 1979 by Aydin Systems of San Jose, California.

Containing portables, mobiles and pagers with telephone interconnect capability, the system was undoubtedly in full operation during the attack on the Libyan military base by U.S. forces.

BASE	CH.	INPUT	OUTPUT
Tobruk	1	418.350	411.350
	2	418.625	411.350
Benghazi	1	417.725	412.725
	2	416.925	412.725
Tripoli	1	418.625	413.625
	2	416.925	413.625
Wattia	1	416.925	411.925
	2	418.625	411.925

We would like to thank the contributor who wishes to remain anonymous for this interesting item to share with MT readers.

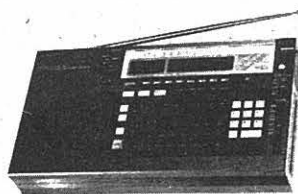
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SONY ICF-2010



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—Larry Magne, 1986 World Radio TV Handbook

Yes, Sony has finally brought out a full-featured portable for the serious shortwave listener. With a frequency coverage from 150-30,000 kHz (AM/SSB), 76-108 MHz (FM) and 116-136 MHz (AM aircraft), the 2010 has both direct-frequency keyboard entry as well as a tuning dial. A 32-channel memory may be scanned and frequency readout is on a crisp liquid crystal display.

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Building a Scanner Antenna from Scrap

The antenna shown in the accompanying photographs was built almost entirely from a discarded TV antenna. Using the dimensions indicated on the diagrams it will cover from 140 to 150 MHz, providing about eight dB of gain over a half wave dipole antenna.

If you are in an average location (not at the bottom of a deep valley) this Yagi antenna will more than double your normal range! The antenna receives best from one direction, but has a broad lobe (about 45 degrees) and does not need to be aimed exactly dead center. A small TV rotator will do an excellent job of aiming the antenna where you want it.

Take a look at photo number one and figure one; this is the antenna in its operating position. The long horizontal part of the beam is called the boom and the vertical rods are called the elements.

The element to the right of the photo is called the second director; its job is to focus the incoming signal back towards the next element (the first director) which, in turn, focuses the signal back to the driven element (our feedline is connected here).

The element to the extreme right is the reflector which bounces the focused signals back to the driven element. The focusing and reflecting of the signal by these elements cause the incoming signal to be amplified many times before it heads down the feedline to our receiver.

Construction

An old TV antenna should provide most of the required parts. You will need to obtain about four feet of 12 gauge solid copper wire, such as used by electricians for house wiring, and a piece of quarter inch plastic or wood for the insulator block.

Start by making the balun (balanced to unbalanced transformer; see figure 2) a 30-inch piece of coax (RG-8 or RG-58) with the outer insulation cut off both ends to a length of 1-1/2 inches (leaving 27 inches of insulation on the coax).

Next, fully unbraid the shield wires on each end and carefully twist them together. Strip one inch of the inner insulation from the center conductor.

Using your soldering iron apply a little solder to all of the bare wires - including the shield - being careful not to melt the insulation. Solder number 6 solder lugs to the center conductor on each end. Set this aside for now.

Figure one shows an overall view of the antenna. Note that the elements are labeled and lengths are given for each (R=reflector, DE=driven element, D1=director one, and D2=director two).

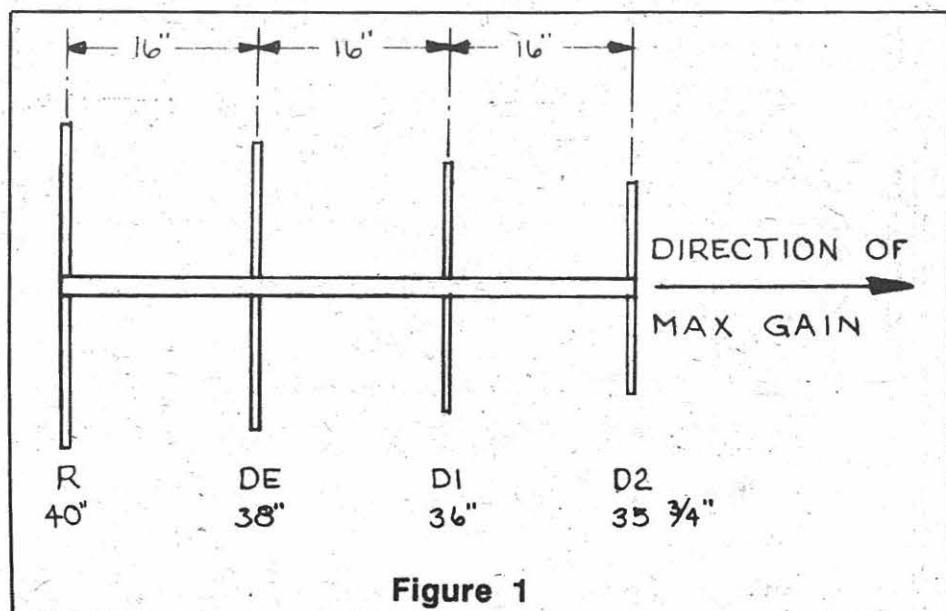


Figure 1

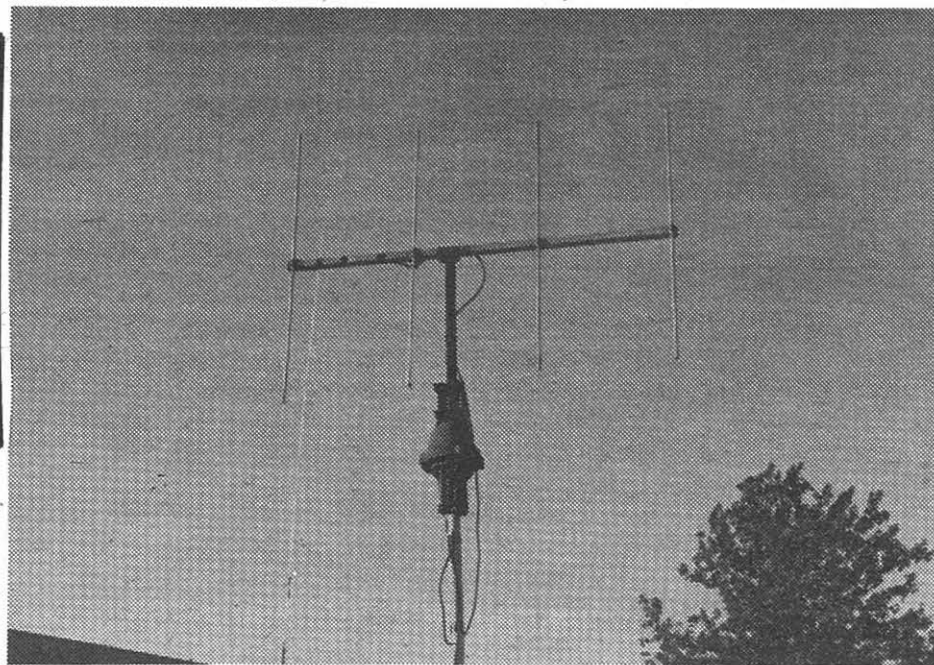


Photo One - Antenna in operating position

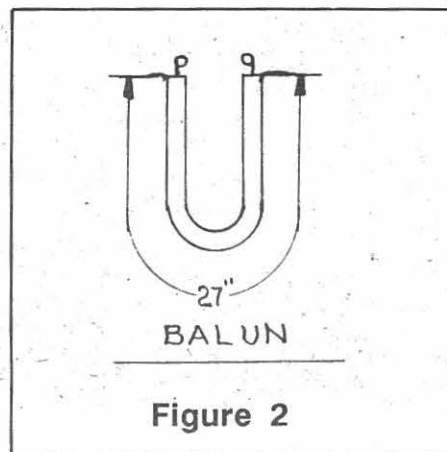


Figure 2

The boom may be made from metal, wood, fiberglass, or PVC; it should be 3/4 to 1 inch square or round (square is easier to work with as most TV antenna booms are square). Cut the elements to length indicated in figure 1.

If you have a square boom, the elements can be mounted to it by drilling two 1/8th-inch holes in line spaced about 1/8th inch each side center. Drill matching holes in the boom and attach the element with two 4-40 stainless machine screws long enough to go through the element and the boom. Secure them with lockwashers and nuts.

Mounting the Directors and Reflector

The elements are made from the aluminum TV elements (the thicker the better). It is a good idea to insert a 2-inch-long hardwood dowel into the center and ends of each element to prevent crushing when you tighten the elements; it will also make the entire structure much stronger. You may coat the dowels with shellac, varnish or glue to hold them in place.

I mounted my element with clamps that I made by removing the clamps that held the TV elements to the boom. These clamps are easy to do out, then are redrilled with a 5/32 hole in the center of the element.

Put the clamp over the element and use a 6-32 stainless machine screw through the clamp and element; use a second screw on the long side of the clamp to tie the assembly down tight.

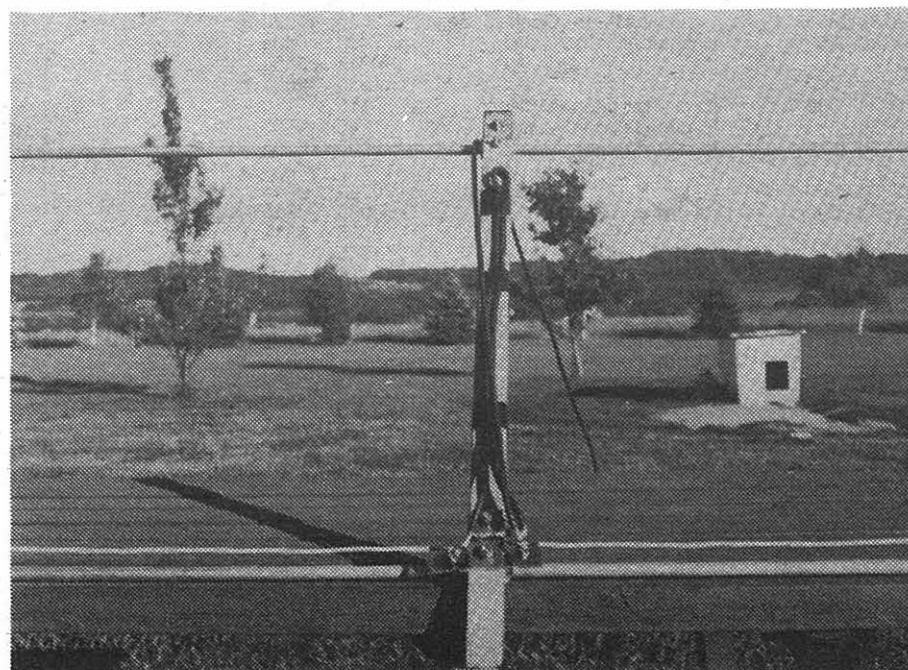


Photo Two - The folded dipole--ready to mount!

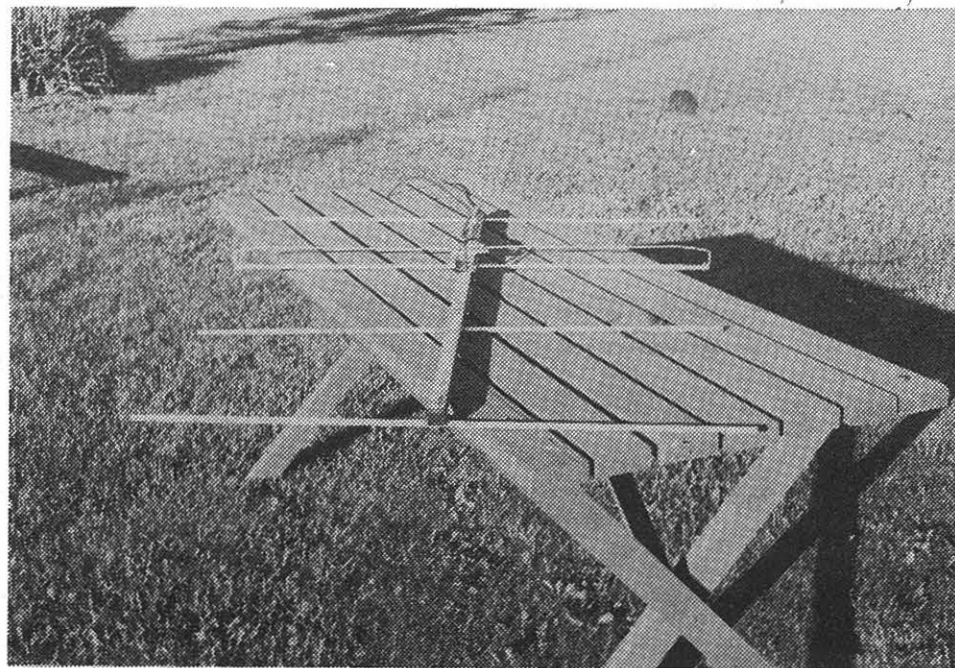
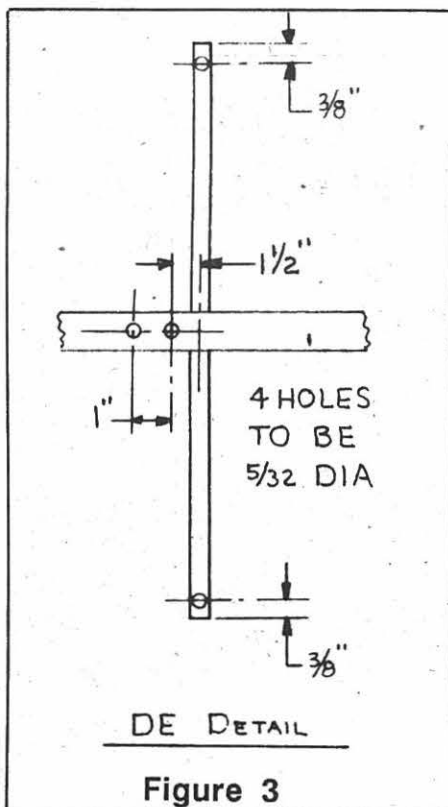


Photo Three - Insulator block, balun/feedline details

PRIVACY BILL HEARINGS TO RESUME

After a three week recess over Labor Day, the U.S. Senate is scheduled to resume deliberations on the Electronic Communications Privacy Act of 1986 early this month.

While some concessions have been made and penalties for infraction have been lowered substantially, it is virtually certain that there will be some restrictions placed on casual interception by hobbyists of some radiotelephone communications and encrypted (scrambled) transmissions.

MT will keep our readers informed of the latest developments in the issue.

If you use a round boom, drill a hole large enough to accept the element, and then secure the element with a machine screw in the center.

Take a look at the driven element (DE) detail in figure 3. Note that a 5/32nd hole is drilled 3/8th of an inch from each end--try to keep these holes in line.

On the boom beneath the driven element measure back 1-1/3 inches from the center of the DE and drill two 5/32 holes on 1 inch centers to mount the insulator block.

The insulator block is made as shown in figure 4. It should be constructed from 1/4-inch plastic or wood (if wood, apply two coats of shellac or varnish).

Mounting the Driven Element

The driven element is called a folded dipole (photo 2). To make the folded dipole (see figure 6) strip one inch of insulation from the end of a 24-inch long piece of 12 gauge solid wire. 3/8th of an inch from the center of this loop, make a 90 degree bend; 1-1/4 inches from this bend make another right-angle bend in the same direction. Make two of these wires.

Attach the wires to the DE with two 1/2-inch-long stainless 6-32 machine screws, using lock washers and nuts to secure. Mount the insulator block to the boom beneath the DE using 6-32 stainless hardware. Put 6-32 hardware in the empty holes in the insulator block.

Cut the 12 gauge wire off about one inch beyond the screws you put in the block. Strip about 1-1/2 inches of insulation from the wire and solder a #6 solder lug to the wire and secure the lug to the screws in the insulator block (see photo 3 for these details).

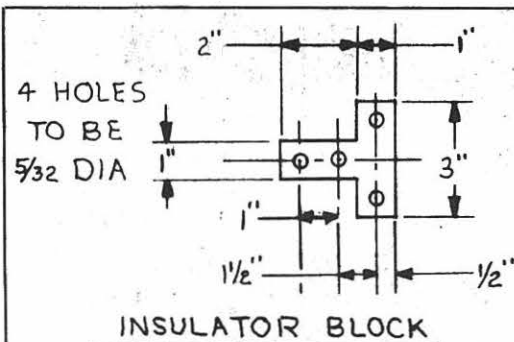


Figure 4

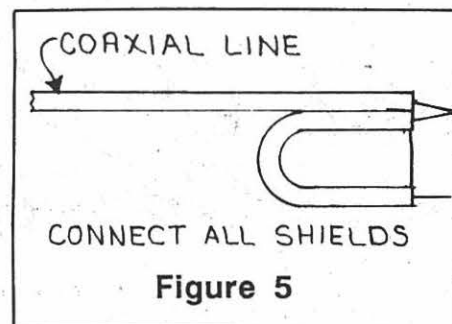


Figure 5

Now the elements are mounted and you are ready to attach the feedline and balun. (The balun is an impedance matching device and should not be omitted.) Use a good grade of coax for runs in excess of 50 feet; copper-braided RG-8/U or RG-59/U is recommended. Strip about 1-1/2 inches of outer insulation from the end of the feedline; unbraid the outer conductor, twist it together and tin it with solder. Strip one inch from the inner conductor and solder to it a number 6 lug.

Now solder the tinned braid of the feedline to the braids on both ends of the balun as shown in figure 5 and attach as in figure 6 (photo 3 shows details of this connection). Tape the balun to the boom in a U as shown.

Next, find the balance point of the antenna and drill it for a U bolt and

clamp to mount your antenna to the mast. Since you will probably want to receive FM business band and emergency services or ham FM, be sure to mount the elements so that they are vertical to the earth (i.e., up and down).

Over the years I have built about a dozen of these little beams and I am always amazed how well they perform. Don't be afraid to jump in and build one your way. I built one of these antennas by nailing the elements onto a 1 x 3 board and it worked just fine!

Take care, gang, and keep the letters coming. Please remember the self-addressed stamped envelope if you need a reply to your letter. 73.

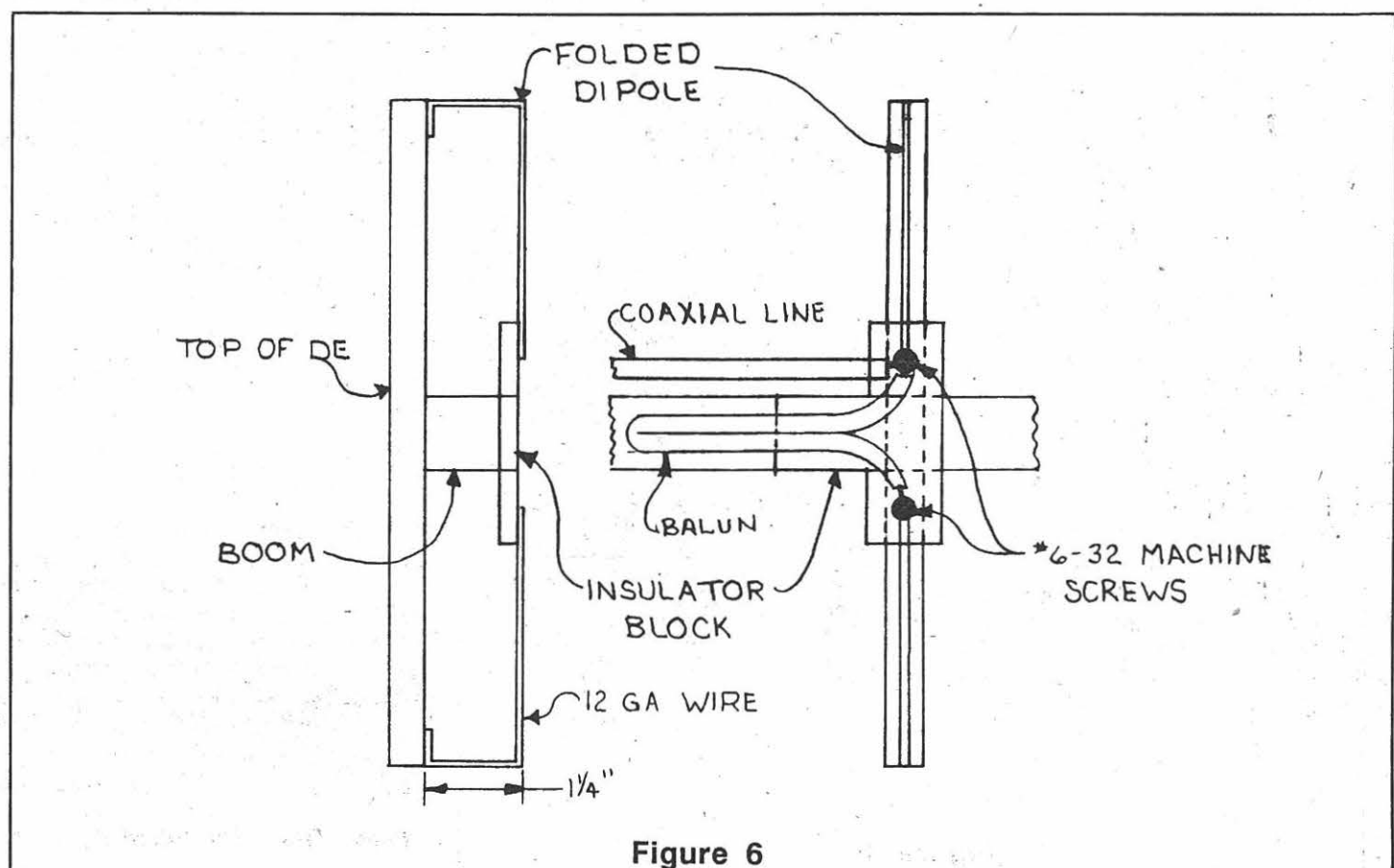


Figure 6

We welcome short, useful listening hints, tips on equipment use, hard-to-find sources, etc.; Let others profit by your hard-won experience!

ICOM R7000 User's Notes

by Jim Dantin

The long wait finally ended for me in the second week of June when UPS delivered ICOM's latest marvel--the R7000 scanner. I placed an order for one sometime in November 1985 and was given the #3 slot on the store's waiting list. At the time, I fully expected to receive my unit by Christmas--I guess Santa counted up a few more black marks than I had!

During the last eight months, I made a number of inquiries at ICOM and was told that the original production run of R7000's had been placed on hold--apparently the performance wasn't up to expectations and a complete redesign of some of the circuitry was necessary to reduce spurs and make it perform better than the competition (Yaesu FRG-9600). This caused the lengthy delay in delivery.

At the Dayton Hamfest, I shouldered my way into the ICOM booth and got my hands on one of the first units to reach the U.S. Although I didn't get to do much more than scan the two-meter band, the audio quality and general "feel" of the machine confirmed my trust that the R7000 would be worth the wait.

That N-Connector

When you first unpack the R7000 you are greeted with surprise #1: the antenna connector. In its quest for ultimate performance, ICOM knew better than to use the common Motorola connector found on most scanners. After testing BNC's and a few others, they settled in on the Type N. Unfortunately for us, this is not your common Radio Shack part. A trip to a ham radio outlet or well-stocked electronics parts house may be necessary; or, you may wish to order the F to N adapter from Grove Enterprises (\$2).

In a pinch, I found that a push-on PL-259 will mate up sufficiently well to get you through until you acquire the proper connectors! Don't "push" too hard, or you'll shove the center conductor of the Type N jack back into the radio! You'll then spend a few minutes trying to figure out why a normal Type N plug won't make contact (the voice of experience tells only the truth)!

An Indoor Whip

If you don't have an outside antenna (shame, shame), you are faced with problem #2--the ICOM doesn't come equipped with a built-in whip. While I don't anticipate wanting to use an indoor whip instead of my roof-mounted Grove OMNI, I do like to be prepared for storms or for "portable" use.

Radio Shack's 20-161 is an inexpensive whip antenna intended for indoor use; it is equipped with a Motorola plug for use in "normal" scanners. An adapter is needed to hook it up to the ICOM.

I acquired a UG-603A/U Type N connector from a friendly ham. This connector mates up nicely with RG-6/U cable, by the way. It also has the convenient feature of being sized just right to be the basis of a Type N to Motorola adapter! Radio Shack's 274-710 solderless "Car Radio" jack supplies the remaining components.

Here's how to build the adapter: First, cut a 1" piece of center conductor from some RG-6/U cable (any bare 18-20 gauge wire will do fine). Solder it to the center connector of the Type N plug. Except for the main body of the plug, you won't need any of the other parts.

Next, take apart the Motorola jack. It has a small screw connector for the center lead. Insert the wire and tighten the screw slightly. The tubular ground connector can then be assembled back onto the jack.

This assembly can be slipped into the Type N plug in place of a piece of coax. If you deform the ground connector slightly, it will be a friction fit into the Type N jack body.

Once you have everything adjusted, tighten the screw and reassemble (you may have to trim the wire if it interferes with the Motorola plug). The black plastic body from the Motorola jack can be trimmed down to make an outer cover for the adapter. Plug in your antenna and you're finished!

Background Hiss

A third area of frustration comes with the attempted use of earphones. Even with no signal present, there is a low background hiss present. In a quiet room, the hiss quickly becomes unbearable.

A quick fix for this problem consists of connecting a 1/8 watt resistor in series with the earphones. I used a 1,000 ohm resistor mounted inside the connector plug. You will have to experiment to find the lowest resistance that eliminates the hiss from your phones.

A Word About Earphones

On the subject of earphones, I can recommend the Radio Shack 33-374 "Micro In-Ear Design." This unit is intended for personal stereo applications, but can be easily modified into a high quality scanner earplug.

The earphones can be separated into two complete monaural units. There is a small molded plastic piece that must be carefully cut off and the wires "zipped" apart. Attach a 1/4" phone plug and you're in business. Take a look at the Radio Shack 274-254 Right-angle plug--it makes for a neater installation and there's plenty of room for the resistor.

Minor Improvements

There's a number of refinements and modifications that can be made to the ICOM. The scan function needs a

variable delay after the signal drops out; the display is 'way too bright in the "dim" setting; and the recorder control sometimes cuts the voice synthesizer short.

Drop Bob Grove a note if you develop any interesting mods or make a suggestion if you see a need for one. Perhaps we will do another article for users of the ICOM R7000 to exchange ideas and learn how to get the most out of our investment.

NEXT MONTH: Bob Parnass shares a modification to achieve faster scan on the R7000.

"Wandering Birdie" --Solved by Regency

Some months ago, MT reported our discovery of a "wandering birdie," an erratic, internally-generated, spurious signal in Regency's HX1200 hand-held programmable scanners. The mysterious signal would unpredictably stop the scanning sequence for a few seconds until the unstable oscillation gradually drifted away from the affected frequency.

We reported the problem to Regency's engineering department apparently other users did as well. Now we are told that the problem has been solved and that the modification is being fitted into the production run of the new HX1500 scanners, due imminently on dealers' shelves.

Proper Lengths for Grove Universal Antenna

If you are one of the thousands of hand-held radio enthusiasts now using the Grove ANT-8 universal adjustable whip antenna, you will be interested to learn of a simple method of marking the whip sections for rapid adjustment when placing the antenna in use.

The instructions accompanying the adjustable antenna give appropriate lengths, then suggest that the user experiment with different settings for

optimum reception and/or transmission.

After these lengths are determined mark the settings with a stripe of nail polish; this will allow the elements to be quickly set when the collapse whip is placed into service.

We would like to thank Jim Gra W1XU, Advertising Manager for PopCom, for this excellent suggestion.

Speaking of Radio Shack...

Reader Hugh Miller of Seattle suggests that we remind fellow scanner and shortwave enthusiasts that Radio Shack stores have available service manuals for all of their equipment, often including discontinued models.

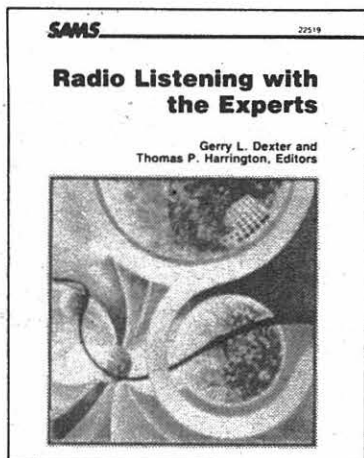
If you own Radio Shack electronics it might be a good idea to get these manuals, usually at low cost, while they are still available. And if you don't own RS gear, the manuals still provide interesting insights into electronic circuitry and servicing.

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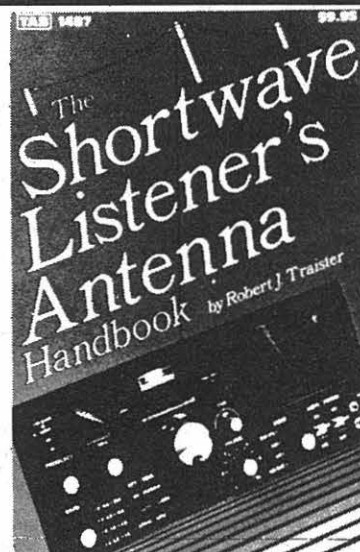
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A Newcomer Discovers Shortwave

by Hall A. Acuff

Recently I sat on a cliff overlooking the ocean near Mendocino, California, and listened successively to news commentators from Moscow, Havana, Melbourne, London, and Bonn talk about the United States' confrontation with Libya in the Gulf of Sidra.

No, I am not a member of the Armed Forces or the CIA; these commentaries were all in the English language and came to me through the magic of my paperback-book-size shortwave radio with its little telescoping antenna.

Although shortwave radio was very popular in the 1930's and 1940's, most North Americans have forgotten, or have never known, the pleasure and enlightenment of listening to the voices of people from

the distant corners of the world. One possible reason is the competition from television and the ubiquitous video cassette recorder.

It is equally likely that people are only vaguely aware of the shortwave medium. If they are aware of shortwave, they may have the incorrect notions that equipment is bulky, expensive, arcane, requires a massive outdoor antenna, is complicated to operate, and has a limited variety of programs broadcast in English.

Many people confuse shortwave listeners with "hams"--amateur radio operators--who transmit as well as receive radio signals, thus they need to pass radio theory and Morse Code tests to obtain an FCC license. No license is required to listen to shortwave broadcast transmissions.

Excellent shortwave radios are available from pocket size (Sony ICF 4910) to the size of a VCR (ICOM IC-R71A) and range in price from \$50 to \$1,000 or more, with many excellent portable and table top sets under \$400 in the \$300-\$500 range.

Many shortwave radio sets offer excellent reception using only their whip antennas, particularly at night. Most inexpensive shortwave radios are as simple to operate as standard AM/FM portables and most shortwave sets cover those bands as well.

Literally hundreds of programs from around the globe are broadcast daily, around the clock, in English as well as many other languages. Programs are as varied as the familiar AM and FM offerings: language lessons, news, religion, sports, weather reports, time signals, music, drama, talk shows, even programs for shortwave hobbyists.

Almost all of the stations are commercial-free, although the propaganda on some stations makes the listener wish for a commercial break!

For the Traveler

Two radios well suited for portable travel are the Toshiba RP-F11 and the Sony 2002.

The Toshiba RP-F11 lists for \$129.95, but is often discounted to \$79.95. This little marvel has dimensions of approximately 7-3/4" x 4-3/4" x 1-1/4", weighs less than 1-1/2 pounds with its four AA batteries which last many hours and has an unusually good performance-to-cost ratio. It has good sensitivity to distant signals, but mediocre rejection of adjacent strong station signals, and has strictly manual tuning.

The Sony ICF 2010 is a good value in a table-top set that is also quite portable (see review on p. 46). It lists for \$349.00 and is available for under \$300 from Grove Enterprises and other MT advertisers.

Oldies, but Goodies?

Many old and second-hand shortwave sets still perform well and can be picked up inexpensively at electronic swap meets, garage sales and the like. However, most neophyte shortwave listeners would do well to choose new sets.

If you do wish to purchase a second-hand set, some caveats are in order:

1. Before you buy a second-hand set, make sure it works.
2. Demand a written, money-back guarantee if the set is not working as represented.
3. Do not pay over \$100 for any old second-hand set unless you are a repair expert.

One popular, old table-size shortwave set which still performs well with a good outdoor antenna is the Hallicrafters S-40/40A manufactured in the mid-forties. The cabinet was designed by Raymond Loewy and the set has been selected for the permanent design collection of the Museum of Modern Art in New York. These sets in good working condition sell for \$40-\$80.

There is a wide choice of shortwave receivers available for portable travel and for home use. For tests of 75 top receivers by radio engineer Ranier Lichte, obtain the book Radio Receivers--Chance or Choice, available from Gilfer Shortwave.

Meters or Megahertz?

by Bob Grove

Radio waves are often pictured as sine waves, ripples which undulate across the printed page. In fact, radio waves do have an alternating property, but do not look like the traditional sketch which is a mathematical graph representation of one isolated portion of the energy field.



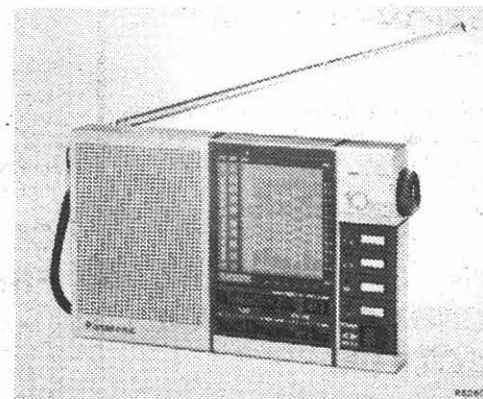
Since radio waves travel at the speed of light (over 186,000 miles per second) and are fluctuating their energy as they go, there is a measurable length in space between each repeated fluctuation. The length of one wave is measured in meters.

The more rapidly the waves fluctuate (higher frequency), the shorter the distance between the each wave length; thus, the higher the frequency, the shorter the wavelength.

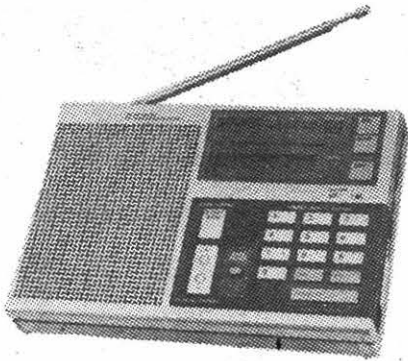
We can identify a radio signal, then, by either of two properties, wavelength (in meters) or frequency (kilohertz or megahertz). For example, if we measure the actual physical length of a radio wave vibrating 10 million times per second (10 megahertz) it would be nearly 30 meters long.

Knowing either the frequency or wavelength, it is easy to find the other; frequency (in megahertz) times wavelength (in meters) equals 300. Therefore, a 6 megahertz frequency has a wavelength of 50 meters.

Now we see why the shortwave broadcast and amateur bands are frequently given in the nearest whole-number wavelength; 4 MHz is the top of the amateur 75 meter band and 9.675 MHz would be occupied by a broadcaster in the 31 meter band. Multiply either of those two pairs of numbers together and you will confirm their relationship (300).



From the simple to the sublime -- A listener can choose an inexpensive receiver such as the Panasonic RF-B50 shown above, to top-of-the line models such as the JRC NRD-525 or the ICOM R71A.



Sony ICF-2002 -- Well-suited for portable use.

Antennas

An outdoor antenna can greatly improve shortwave reception on most all sets. A simple "longwire" antenna installed as high in the air as possible on a house, apartment, between trees, or even in an attic is a good start. Some radios are sold with a wire antenna.

Radio Shack sells an outdoor antenna kit for less than \$10 which is suitable for many reception locations and conditions. A much more sophisticated (and expensive) antenna is the "Eavesdropper" brand sold for under \$60 by amateur radio shops and available from mail order radio stores.

An extremely effective shortwave dipole, and one which does not compromise certain frequency ranges like a trap dipole does, is the inexpensive "Skywire," \$19 from Grove Enterprises and Grove dealers.

For apartment dwellers and other who need a very compact indoor antenna, the recently-discontinued Sony AN-1 is an excellent choice and is still available from some dealers. The Grove Hidden Antenna and Power Ant combination is another good choice.

With some sets and under certain listening conditions, a "ground" wire may improve reception. Instructions for installation and use are provided with most shortwave radios.

For Your Reading

To tune in the world on a systematic rather than a hit-or-miss basis, you will also need a list of station broadcast frequencies and broadcast schedules just as you would for AM, FM or television. A subscription to *Monitoring Times* costs only \$14 per year.

Another good magazine easily understandable to the beginner is *Popular Communications*, available on newsstands or by subscription from the publisher.

The most comprehensive available listing of radio and television stations worldwide, but quite unnecessary for the beginner, is the annual paperback book *World Radio*

Television Handbook, published at \$17.95 available in some bookstores and most amateur radio shops.

Locating a radio station on a map or chart and determining the distance the signal traveled to you can greatly enhance your listening enjoyment. The radio amateur's "Great Circle Chart of the World," 9th Edition, published by Radio Amateur Callbook, Inc., is also available in amateur radio shops and from the

publisher.

Finally, you will need to become accustomed to a new timetelling system. Broadcast times for reception of shortwave radio programs are listed in Universal Coordinated Times (UTC), similar to Greenwich Mean Time (GMT). World time charts are furnished with most new shortwave receivers and are also available in amateur radio shops.

A handy accessory is a clock which indicates both local and UTC, available from many equipment dealers.

After listening to shortwave a while you may "get hooked" and start collecting countries and radio stations the way others collect stamps. If you never learn more than what other countries really say and think about us, your time tuning in the world will be well spent.



Special \$239.99 (7.00 shipping)

50 Channels — Mobile/Base

Features include simple raised button keyboard programming of the following frequency ranges: 32-50 MHz, 118-136 MHz, 144-174 MHz, 421-512 MHz. Vacuum fluorescent display, dim control, priority, count transmissions, non-volatile memory retains memory without power back-up, automatic search, scan speed control, automatic search, scan delay, lockout, service search, automatic squelch, crystal-less, digital clock, external speaker & tape jack, auxiliary equipment control, plus much more. Built inside the rugged metal cabinet. Includes AC & DC cords, telescopic antenna, mobile mounting kit, and one year factory warranty on the Bearcat 300 for only \$239.99 and \$7.00 shipping. (Optional extended warranty: 3 years \$35, or 2 years \$25.)

REGENCY HX1200

Digital programmable 45 channel hand-held Scanner. Frequency coverage 30-50MHz, 118-136MHz, 144-174MHz, 406-420MHz, 440-512MHz. Covers public service bands plus Aircraft. Has priority, search, lockout, scan plus much more. Package includes HX1200, AC charger/adaptor, Ni-Cad battery, carry case, rubber antenna and 90 day factory warranty. **\$216.99** (6.50 shipping) (3 year extended warranty only \$35.00, 2 year \$25.00)

BEARCAT 50XL Programmable Hand-Held	124.99	(5.00)
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BP50 Ni-Cad Battery Pack for 50XL	12.95	(.00)
BEARCAT 180 AC Digital Scanner	159.99	(5.00)
BEARCAT 140 AC Programmable Scanner	94.99	(5.00)
BEARCAT 145XL AC Programmable Scanner	104.99	(5.00)
BEARCAT 175XL AC Digital Scanner	159.99	(5.00)
BEARCAT 100XL Digital Hand-Held	189.99	(6.50)
BEARCAT 210XW AC/DC Digital Scanner	189.99	(6.50)
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BEARCAT 300 AC/DC Digital Scanner	239.99	(7.00)
BEARCAT 800 XLT AC/DC Digital Scanner	319.99	(6.00)
BEARCAT DX-1000 Shortwave Receiver	284.99	(12.00)
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REGENCY MA-257 Cigarette cord for HX1000/1200	16.99	(.00)
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REGENCY HX-CASE Hvy Leath. case for HX1000/1200	34.99	(.00)
REGENCY MA-256 Drop in charger for HX1000/1200	69.99	(3.50)
REGENCY R-1060 Programmable 10 chan. AC Scanner	94.99	(5.00)
REGENCY HX-2000 Digital Hand-Held	159.99	(7.00)
REGENCY MX-3000 AC/DC Digital Scanner	198.99	(6.50)
REGENCY MX-4000 AC/DC Digital Scanner	179.99	(7.00)
REGENCY MX-5000 AC/DC Digital Scanner	329.99	(6.50)
REGENCY MX-7000 AC/DC Digital Scanner	399.99	(7.00)
REGENCY Z-30 AC/DC Digital Scanner	129.99	(5.50)
REGENCY Z-45 AC/DC Digital Scanner	159.99	(5.00)
REGENCY Z-60 AC/DC Digital Scanner	179.99	(5.50)
Mobile Mounting Bracket for Z Scanners	5.99	(.00)
REGENCY D-810 AC Digital Scanner	179.99	(5.50)
REGENCY ACT-R-1 AC/DC Cryst. Single Channel	75.99	(4.00)
REGENCY RH-256 High Band Transceiver	399.99	(7.75)
REGENCY UC 102 Hvy VHF Hand Transceiver	119.99	(5.50)
REGENCY RU150B UHF Transceiver	439.99	(7.75)
Book "Top Secret Registry of Gov't Frequency"	12.95	(.00)
Book "Covert Intelligence, Electronic Eavesdropping"	8.95	(.00)
Book "Betty Bearcat Frequency Directory"	14.95	(.00)
Book "Rail Scan Directory"	7.95	(.00)
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RCD MRP-1 Single Channel Hand-Held	38.99	(3.00)
JIL SX-200 AC/DC Digital Scanner	189.99	(6.75)
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Regency Z30 30 Channel Automatic Programmable Scanner

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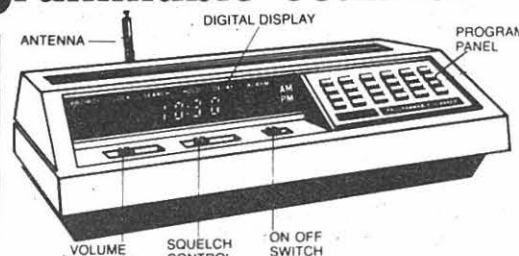
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Optional Accessories:

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home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz. Size 10 3/4" W x 2 7/8" H x 8 3/8" D.

Sophisticated microprocess-controlled circuitry eliminates the need for crystals, instead, the frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The Z30 scans approximately 15 channels per second.

Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function locates unknown frequencies within a band.

Other features include scan delay, priority and a bright/dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The Z30 can be operated on either 120 VAC or 12 VDC. Includes one year warranty from Regency Electronics (optional 3 yr extended warranty only \$35, gives you a total of 4 yrs complete warranty or 2 yr extended warranty only \$25, gives you a total of 3 yrs complete warranty.)

Regency HX2000

\$159.99 (Plus \$7.00 Shipping each)

Digital Programmable 20 Channel Hand-Held Scanner with raised button keyboard for easy programming of the following frequency ranges: 118-136 MHz, 138-174 MHz, 406-512 MHz, 800-950 MHz (NOTE: This is the only hand-held portable scanner which will receive the 800-950 MHz range plus high band, air, and UHF). Features include priority, scan delay, memory backup, dual scan speed, channel lockout, jacks for external antenna and earphone, 90 day factory warranty, keyboard lockswitch, sidelit liquid crystal display for night use, program AM or FM mode, search or scan, size is 3" x 7" x 1 1/2". Complete HX-2000 package includes Ni-Cad rechargeable batteries, wall charger adapter, protective carry case, and rubber antenna. All for the low price of only \$159.99 plus \$7.00 shipping each. (Optional extended warranty: 3 years \$35; or 2 years \$25.)



\$179.99 (Plus \$7.00 Shipping each)

Digital programmable 20 channel scanner operates as a Base or Mobile unit or can be used as a portable with rechargeable Ni-Cad batteries included. MX4000 covers the following frequency ranges: 30-50 MHz, 118-174 MHz, 406-512 MHz, 800-950 MHz. Features compact size of 5 1/2" x 2 1/2" x 7 1/4", memory backup, scan delay, priority, dual scan speed, channel lockout, jacks for earphone and external antenna, keyboard lockswitch, one year factory warranty. Sidelit liquid crystal display for night use, program AM or FM mode, search or scan, reset button. Complete MX 4000 package includes telescopic antenna, mobile mounting bracket, mobile power cord, rechargeable Ni-Cad batteries, wall charger adapter. All for the low price of \$179.99 plus \$7.00 shipping each. (Optional extended warranty: 3 years \$35; 2 years \$25.) Optional cigarette lighter Plug #4000MPC \$4.99.

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\$199.99 (6.50 shipping) Handheld digital programmable, no crystal portable scanner. 16 channels, search feature, plus more! Frequency range: 30-50, 118-174, 406-512 MHz. Included in the package is a flexible rubber antenna, earphone, battery charger/AC adapter, 6 AA Ni-Cad rechargeable batteries and a heavy duty carry case. All for the low price of:

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(3 year extended warranty only \$35.00, 2 year \$25.00)

REGENCY RH-256B

PROGRAMMABLE TRANSCEIVER

RH-256B Transceiver, 16 channel 12 VDC 2-way Radio fully programmable in transmit and receive mode. Includes built-in CTCSS tones for encode/decode, time-out timer, scan delay, 25 watts transmit power, priority, plus more. Frequency spread as shipped 152-158 MHz. Package includes mobile mike, bracket, mobile antenna, and all cables and instructions for installation. **Special package deal only: \$399.99** (7.75 shipping) (2 year extended warranty \$49.00 — 3 year \$69.00)

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(Radio Tahiti cont'd from p.7)

it's pretty easy to find RFO's signal if you know where and when to try. The only problem is the fact that the programming is in either Tahitian or French so, unless you speak either, it's hard to be sure what you've got.

Best bet is to try the frequencies on the RFO QSL card shown here (by the way, RFO's medium wave transmitter is really on 738 kHz, not 740). They've changed, their logo, incidentally, and this one is the latest edition (May, 1986). RFO has been upgrading their radio transmitters and eagerly welcome reception reports. If you send yours to the BP 125 Papeete, French Polynesia address, I have been assured by the RFO technical staff that they'll QSL.

Schedulewise, the RFO broadcast day begins at 5:30 AM Tahiti time (1530 UTC) and runs until 11:00 PM that night (0900 UTC). One of the best times to try is at 11:00 AM Tahiti time (2100 UTC) when all frequencies are in use and the programming is in Tahitian. This hour consists of news followed by messages to people on the outlying islands. After this there are even

obituaries and, following it all, Tahitian music. At 6 and 7:00 PM (04 and 0500 UTC), you can catch the dinnertime news in Tahitian.

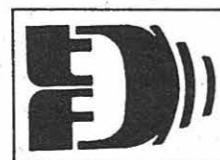
If you speak French, tune in on the hour at other times and listen for the news. The IDs consist of a synthesizer-produced instrumental intro to a female voice first saying a few words in French followed by two female voices singing the letters "RFO" in French. The whole ID runs about 8 seconds and they run it at least twice an hour; usually between features. There are commercials, most of them in French, throughout the broadcast day.

Most of RFO's programming is in French and there is no English service either operating or planned at the moment. This is not the case with RFO television, however.

Because the population of Papeete and the nearby islands contain a substantial number of English-speaking people, RFO has begun an evening TV news program in English. There are three other independent FM radio stations in Papeete which also broadcast English programming. FM/TV DXers might keep this in mind when poking around in this direction. It's a pretty long shot but



**RADIO
TAHITI**



FREQUENCES

740 KHZ	20 Kw
6135 KHZ	4 Kw
9750 KHZ	4 Kw
11825 KHZ	20 Kw
15170 KHZ	20 Kw

I've seen sporadic E-layer propagation paths do some strange things -- even at this low end of the solar activity cycle.

While I was in French Polynesia between March 15th and May 1st, I spent quite a bit of time listening at just about all hours of the day and night to see what someone living there might expect to hear. Interestingly enough, just about every resident I asked had a receiver and was either a regular SWL or wanted to be. The complaint most often heard was of unknown or unavailable schedules for the shortwave broadcasters. From the material I had with me, I hand-wrote and photocopied time and frequency schedules for the major broadcasters; the little pile of them I produced disappeared like \$100 bills on a busy street. Perhaps the lure of world news was due in part to the events going down in and around Libya at that time but there was no shortage of interest in any case.

In the seven weeks I stayed in French Polynesia, I logged a total of 26 countries on a Magnavox D2924 portable receiver a friend had loaned me for the trip. In the same class as the Sony ICF-2002, the Magnavox is a good little phase lock loop-based AM-only receiver with digital tuning and at least average sensitivity. My antenna was a 50-foot longwire alligator-clipped to the built-in telescoping whip and pointed northeast.

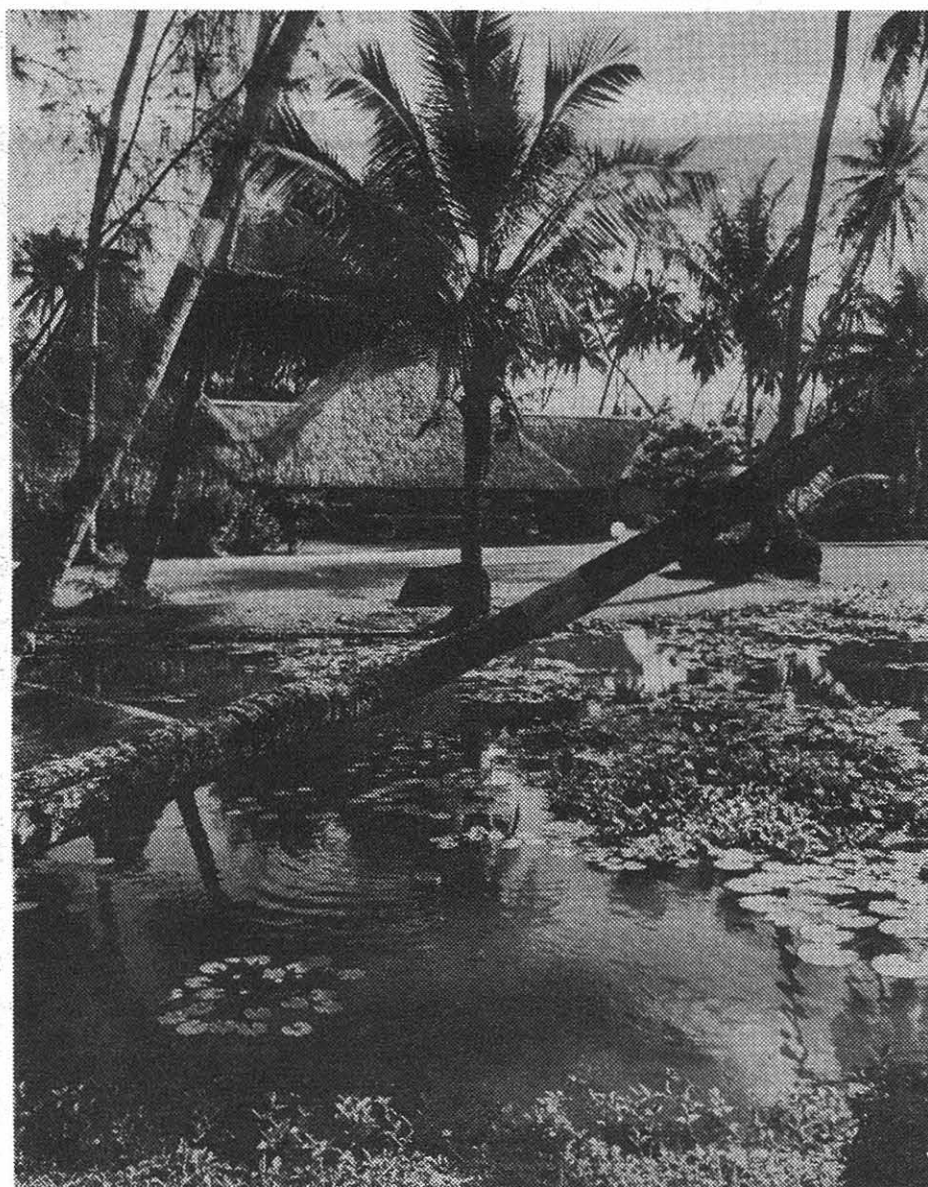
As you might expect, all the biggies of the shortwave world came booming in with the notable (and welcome) exception of the glut of overdriven, frequency-spattering religious stations I'm used to hearing in my Mojave Desert home. Polynesia is not the primary target area for many international broadcasters and many of the overseas services I copied were intended primarily for Latin America.

Ever present were Radio Australia and Radio New Zealand on both short and medium waves. WWV and WWVH were also easily monitored and their signal quality as a function of time gave me a quick idea of which paths were open to where. Same goes for Radio Japan, Radio Beijing, RSA, and Kol Israel whose signals fluctuated over a wide range but, over the long term, were pretty easy to copy. Radio Moscow and the BBC's service to the Pacific were well heard as was VOA and AFRST -- the latter being the most popular source of news for expatriated English speakers living in Polynesia.

In the not-so-good department was (surprisingly) Radio Canada International whose signal seldom made its way down to my part of the world. Actually, RCI's 0200 UTC broadcasts on 5960 kHz were regularly interfered with by jamming. Everybody's favorite, Radio Earth via WHRI, rated a SINPO of 22342 when I caught my own Skyline show on 7400 kHz. I didn't find out about their move to 7355 kHz until I got home.

During the best propagation conditions, I was able to copy Voice of the Islamic Republic of Iran (1200 UTC, 11790 kHz), Radio Tirana (0230 UTC 7120 kHz), and Radio Bucharest (0700 UTC, 9690 and 15250 kHz). If you live on the east coast of North America, these three might be pretty easy for you to copy but in the west they're relatively difficult; in Polynesia they seemed to be rare at best.

Medium wave wasn't bad either. Night brought some interesting listening as I tuned across the band. Radios New Zealand and Australia popped up in several places (565, 603, and 1315 kHz) while quite a few U.S. stations made the crossing remarkably well. KRAK, a 50 Kw country station in Sacramento, California literally boomed in over the whole time I was there. Other



The lush, South Pacific setting proved to be more beautiful than expected. Pictured is the main restaurant at Club Mediterranee on the island of Moorea.

clear-channel biggies like KSL (1160 kHz) and KFI (640 kHz) faded in and out with regularity as well as WOAI (1200 kHz) in San Antonio, Texas. Among the more interesting catches was the sign-off of a station in Tennessee at 1000 UTC on 28 April. Though I never copied an ID, the station was on 1170 kHz and made the announcement that it was using a 5 kW transmitter.

Everything considered, if you plan to go to Polynesia or anywhere else in that part of the world, taking your receiver is well worth it. Some of the people I met and gave time and

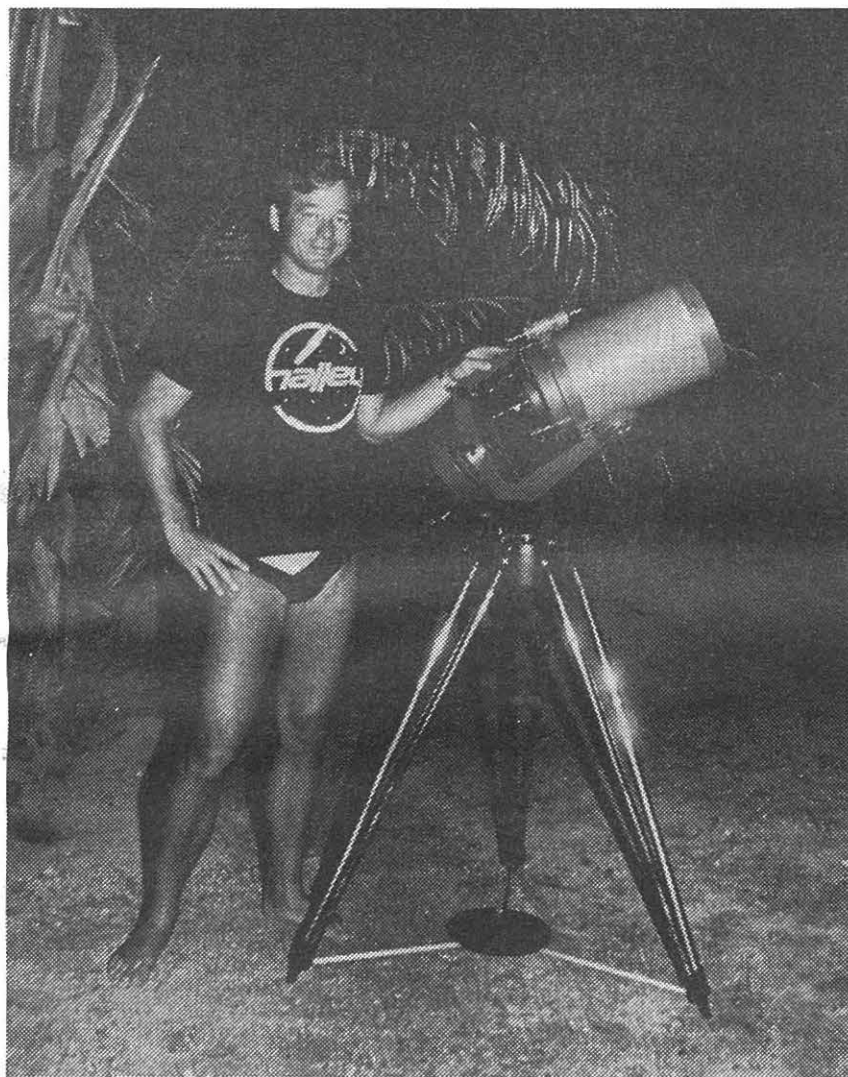
frequency information at the beginning of my stay apparently tried it and came back to thank me for it before I left. A well-informed and equipped SWL in Polynesia is in a good place.

French Polynesia, besides being one of the most beautiful places on the planet, is also one of the most fascinating for we representatives of the civilized world. The people were friendly, open, and cheerful and they're as truly interested in learning about you and your existence as you are about theirs. This island paradise is the home of one of the more

unique societies in the history of the world and the best thing of all is the fact that, even without traveling there, you can hear it on your shortwave radio. ■

If you've enjoyed this article on Tahiti, don't forget to participate when MT goes even further afield...to Beijing, China. Let Larry Miller be your emissary across the world!

About the Author



Dave Rosenthal produces "Skyline," a program on astronomy which airs weekly on Radio Earth. For the listeners with little or no background in astronomy, "Skyline" helps bring the universe closer by providing news of the many interesting and easily seen events occurring continuously in the sky. "Skyline" also focuses on the many intimate connections between astronomy and radio. The show is in its third year on the air.

Recently, Dave was commissioned by the world's largest resort corporation, Club Mediterranee, to travel to their village on the island of Moorea in French Polynesia for seven weeks to conduct Astronomy Workshops during the visit of Halley's Comet. In addition to viewing the Comet, Dave provided regular presentations on observing the sky as well as taking high-quality comet photographs. As a member of the International Halley Watch organization band sponsored by NASA, Dave's astrographs will become part of the archives presently being assembled for this visit of Comet Halley.



Relaxing on a beach overlooking the lagoon, everything is suddenly quiet and the only thing you can hear is the distant crashing of waves on the reef more than a mile away.

GOOD NEWS!



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Making Waves

AM DXing with

Paul Swearingen
P.O. Box 4812
Panorama City, CA 91412

"Those who think AM can sound as good as FM must be living in some kind of dream world. They're certainly not in the real world..." So Dr. Bruce Elving quoted an unnamed broadcast engineer in his tenth edition FM Atlas, just out. In his seventh edition, he stated flatly, "FM is the superior of the two media. Even without stereo, FM is capable of broadcasting the full audio bandwidth of 50 to 15,000 Hz, whereas AM, except in unusual cases, does not carry over 5,000 Hz... Other advantages of FM over the older system of AM include better static- and interference-rejecting qualities, an improved dynamic range... and FM radio's wider bandwidth permitting stereo and subsidiary communications activities."

Since 1979, FM radio has commanded over half the listening audience in the U.S. More than a few AM stations have gone bankrupt recently; some exist as nothing more than clones of their FM outlets, simul- or similar-casting programs. Many are dependent upon the "bird" for satellite-carried network programs for all but a minor amount of their programming. Is AM radio (and with it, broadcast band DXing) doomed?

Let's take a more comprehensive view of the situation before we start investing in shroud stock. In my humble opinion, AM radio is going to be around for a long time... but not as we know it in its present form. Dr. Elving and others have been hammering away at AM radio's shortcomings since FM started as an underdog, an afterthought to the well-established AM broadcasting industry. But the differences between the two media are really slight and its high time that we recognized them.

First, the sound. It's true that *some* stations broadcast the full spectrum of audio waves. But most adults are simply incapable of hearing them, either on AM or FM. More important, few receivers which can actually reproduce that spectrum are available to the consumer. And little-known is the simple fact that many AM stations are engineered to sound better than quite a few mediocre FM stations. It's not true that *all* FM stations sound better than *all* AM stations. If you have access to an AM receiver, compare the sound of several AM stereo stations to FM stereo and you'll find it difficult to discern the difference between them. You may also find that a C-QUAM AM station (such as KFI-640) may sound mushy on a non-stereo receiver but quite crisp on a stereo

receiver such as Sony's SRF-A100, especially if you are listening on high-quality headphones.

About a year ago, I made a totally subjective survey of AM stations in Los Angeles using a portable Sharp FV-610B equipped with a pair of good headphones. I found that five music formatted stations (in mono) sounded as good as any FM station: in order, KALI-1430, KDAY-1580, KSKQ-1540, KGFJ-1230 and KWNK-670. KABC-790 and KNX-1070 probably should be ranked with this group but with their talk and news formats, it's hard to judge them fairly. I can also add two more distant stations to the list: KBOI-670 Boise and KAMA-750 El Paso. Is it significant that three stations have Spanish formats (KALI, KSKW and KAMA) and two can be classified as "black/soul" (KDAY and KGFJ)? I don't know, but they do sound better than their FM competition.

Now, when was the last time you jogged down to your local department store and viewed the selection of AM stereo radios? How many of you have ever heard or even seen one? The few that do exist sound great, including the car radios. But until the manufacturers start offering them and retail stores stock them, the existing AM stereo stations are not going to be able to compete against their FM stereo counterparts in the marketplace.

Many AM stations have dropped their music formats in favor of some sort of talk, whether it be network talk shows, all-news, religion, or local gossip and a few FM stations can be considered talk-formatted. Rock music will never again dominate the markets on AM radio and the AM band has become easier to DX with channels adjacent to local stations no longer splattered with 120% modulation spilling across 30 kHz either side of the local. Even WLS-890 Chicago, the last of the major market CHR (Contemporary Hit Radio) station, is adding more talk, and listeners say that crosstown rival WMAQ-670, nominally Country and Western, sounds like a talker these days.

There's no doubt about it. AM radio is in a period of transition. But it's a healthy transition, and stations which continue to carry intelligent, community-service programming will continue to survive and prosper. What do AM'ers WGN-720 Chicago, WDAF-610 Kansas City, KABC-790, and KOMO-1000 Seattle have in common? They consistently score at the top of the ratings lists because they program for their communities - not at them.

If you ever have the chance to listen to a small-town radio station which is still community oriented, you'll hear echoes in its programming techniques to that of its big-city rivals who sit atop the ratings. WIBW-580 Topeka for years has had what they call a modified-talk format. It's part music, part news/talk -- and it works. Look for more of this type of programming in the next five years.


Another signal that the AM band will continue to remain healthy is the planned expansion of the band from the top end of 1605 kHz to 1705 kHz. FCC Mass Media Bureau Chief James McKinner feels that the additional ten channels could produce 500 more AM stations in the U.S. Aside from offering unique DX opportunities as they come on the air, the new stations would provide better local/regional service to minorities, non-commercial services and daytime stations. Already, some radio manufacturers are offering radios with an expanded dial, to 1705 kHz, and McKinney said that stations could be on the air in the new band by 1990.

One novel suggestion to lure broadcasters to the new spectrum is to allow dual-station operation. For example, you might be able to hear this top-of-the-hour ID in a few years: "You're Listening to the Nation's Station, the twin voices of WLW Cincinnati, 700 and 1700 on your radio dial..." With greater skywave propagation characteristics at night in the higher band, transcontinental reception would easily be possible, at least until the new channels are blocked by locals, even if the transmitter power is

limited to the proposed 5 or 10 kW levels.

Finally, let's take a look at the characteristics which make AM superior to FM. If you've ever listened to an FM station at the fringe of its pattern, you know that the resulting white noise can be more irritating to a listener than atmospheric static on AM. Second, the signal pattern of even regional 1 kW stations reaches much further than FM stations. At night, KFI-640 Los Angeles, WWL-870 New Orleans, WBBM-780 Chicago, WBZ-1030 Boston, WRVA-1140 New Orleans, and many other 50 kW'ers blanket the continent, even though their coverage areas have been eroded by locals allowed by the FCC to park on their channels. Those of us lucky enough to be broadcast band DXers can listen to unique broadcasts from across the country. I often listen to oldies from WHAS-740 Louisville, local talk shows on WHO-1040 Des Moines, country music from WBAP-820, chatter and Latin music on KAMA-750 El Paso, Navajo Indian advocates on KTNN-660 Window Rock, AZ, and even the Grand Ol' Opry from WSM-650 Nashville. If you're still listening only to the homogenized, regurgitated programming carried by local stations locked into the bird, you're missing all of America.


I'd like to hear nominations from you as to what AM stations in your area carry the best programming. Send me a description of what you're hearing, and I'll include your choices in a future column. Until next time, good DX!



THE OUTER LIMITS

Dr. John Santosuosso
P.O. Box 1116
Highland City, FL 33846

Scott McClellan
P.O. Box 982
Battle Creek, MI 49016



After several months on vacation and some travelling, it is great to be back. I am also pleased to be working with my good friend Scott McClellan. Together, we hope to bring you the very best and latest in clandestine and pirate news.

A Contest! Nicaraguan Freedom Fighters, an organization which is affiliated with the Nicaraguan Contra Movement, donated several copies of their promotional record, *Wake Up America*. The lyrics are in English on one side and Spanish on the other. Contra clandestine broadcasts are among the most frequently heard these days so this record should be of interest to clandestine fans.

We have three copies which we will award by random drawing. One of these will be reserved for a reader outside of the United States. All you have to do is send a card or letter to

P.O. Box 691, Thorndale, PA 19372 USA. The word "contest" must be on the outside of the envelope or on the face of the postcard. While it is not necessary in order to take part in the contest, your comments about the column and contributions of information are welcome. All entries must be postmarked by September 30, 1986.

And if you want to hear the Contras, you might try for Radio Monimbo on 6230 around 0000 or 0100 UTC, the rather new La Voz de la UNO on 5040 around 0200 or 0300 UTC and mornings about 1100 or 1200 UTC, and of course the long-established Radio Quince de Septiembre which is frequently heard on various frequencies including 5950 and 6265. Programming is normally in Spanish, but you may get lucky and hear a little English.

Colombia: These days the really hot clandestine news is coming out of Colombia. Florida's Terry Krueger writes that he heard a new Colombian clandestine, La Vox de Libertad, on 6030 from 2355 to 0002 UTC. The station opposes the guerrilla organization M-19, but it is not clear if it is pro or anti-Colombian government. In the July 16 issue of *DX South Florida*, Bill Parks reported hearing the same station on 6093 at 1230 UTC. Loggings or further information on La Voz de Libertad from readers would be deeply appreciated.

In the above mentioned issue of *DXSF*, Dave Crawford and Dave Potter also have an interesting report on the now defunct Colombian clandestine Radio Marquetalia, which was operated by the Fuerzas Armadas Revolucionarias de Colombia. The station was destroyed in a ground assault by the Colombian infantry in the summer of 1985. Although some of the staff escaped, others were killed. Radio Marquetalia was located between Bogota and Medellin.

Captain Midnight: Just in case you missed it, America's most famous pirate, John McDougall of Ocala, Florida, entered into a plea agreement with federal authorities. MacDougall, alias Captain Midnight, will pay a \$5,000 fine, serve one year probation, and have his ham license suspended for up to one year. Captain Midnight received national recognition when he overrode an April 27 HBO transmission to broadcast a protest of HBO's policy of charging satellite dish owners \$12.95 monthly to unscramble its signals.

And now for more pirate news, let's check in with Scott McClellan:

The McClellan Report: Pirate radio activity seems to be on the upswing, if the amount of mail received from readers is any indication. Thanks to all of you for your letters; they are appreciated very much. Please contribute to Box 982 regularly!

The Voice of Fubar was the first pirate ever logged for Pennsylvania's Mario Filippi. He caught them on July 7, from 0130 until 0139 UTC. The show was hosted by a male announcer with a very deep voice, which actually sounded like a record being played at a reduced speed. Between rock songs, he would hear strange messages, such as, "Throw down your weapons of war. Love others -- if you don't, your planet is doomed." Thanks for the report, Mario. Keep listening for those pirates!

The same transmission was heard in New York by Cathy Turner. She heard the broadcast between 0120 and 0137 UTC, and reports a SINPO of 33223. The announcer claimed to be "broadcasting from asteroid R71A," and gave an address for QSL's: P.O. Box 245, Moorhead, MN 56560. Thanks for the info, Cathy.

A listener in Idaho who wishes to remain anonymous heard TNFM, his first pirate. He logged them on July 4, from 0335 to 0430 UTC, on 7437 kHz. The program featured contemporary rock music. The male announcer claimed to be broadcasting from British Columbia in Canada with 150 watts on shortwave, and 240 watts on the FM frequency of 100.3 MHz. The address given for QSLs was Box 1345, Ganges, B.C. V0S 1E0, Canada.

Mace Twigg in Minnesota heard

Radio North Coast International on 7442 kHz, June 30, from 0103 until 0159 UTC. Captain Willy played all kinds of music, including rock, polka, waltz, and television show theme songs! Reports go to P.O. Box 245, Moorhead, MN 56560. As usual with pirates, enclose three first class stamps if you expect a reply.

Mace also heard CCAT, Canadian Club Radio, on 7440 kHz, June 30, at 0256 UTC. They played music by Emerson, Lake and Palmer, and announced that they were using a

new antenna to celebrate Canada's 119th birthday. The address given for QSLs was Box 140, 3090 Danforth Toronto, Ontario M1L 1V1, Canada

I'd like to thank everyone for their great contributions to Box 982 this month. Keep it up!

Other news: Thanks very much to Scott, and now let's look at a few other items. If you listened to the radio, made programs, or in an

(Please turn to p.39)

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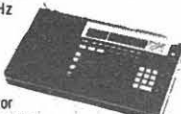
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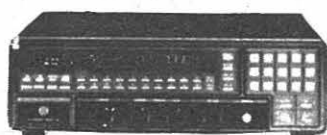
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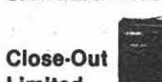


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If you like history and in particular history with a COMINT flavor, you will enjoy two books I just completed reading. The first was *A History of Communications Intelligence in the United States* and is published by the Naval Cryptologic Veterans Association.

Although only 56 pages in length, this book tells the story of the early development of COMINT in the U.S. very well. The U.S. Navy COMINT role is emphasized, but rightly so for they were pioneers in this field. For the price of \$5.00 (postpaid) you can't go wrong. Order from NCVA, 593 Clamar Drive NE, Salem, OR 97301.

The second book was one I obtained from the local library and its title is *And I Was There, Pearl Harbor and Midway--Breaking the Secrets*. The book was written by Rear Admiral Edwin T. Layton and he was at Pearl Harbor, then as a Commander, serving in the capacity of Fleet Intelligence Officer.

Here is the now-it-can-be-told story of events leading up to the attack by the Japanese against Pearl Harbor and other Pacific Ocean bases. The book clearly brings out how COMINT played an important part throughout WWII. With the recent declassification of Top Secret documents, their release by the National Archives provided proof of statements made by Ad. Layton.

Along with the most interesting text are photos, copies of dispatches and translated decrypts, battle maps, excellent notes with source references, and a comprehensive listing of selected bibliography. In my opinion this is the best and most completely researched treatment of the Pearl Harbor-COMINT story. I believe you will definitely find it difficult to put this book down once you have commenced reading it.

Mel Smith, M.D., sent in a tape of a Polish language numbers broadcast. He picked up the transmission on 13200 kHz at 1047Z when a bugle-call with drums signal was intercepted. At 1052 a steady tone replaced the bugle-call and then back to the bugle-call at approximately 1102.

A female operator then commenced sending 5F groups, repeating each group twice, then going off the air at 1108Z. Mel noted that it was three weeks between broadcasts on this frequency with both taking place on a Thursday.

Three splendid additions were made to my shortwave bookshelf during this past month. Two of the books I did not have previously and these were parts two and three of Michiel Schaay's *U.S. Military Radio Communications*. This title is comprised of three volumes that together provide very complete coverage not only of the U.S. Military services but also information on NASA, CAP, FAA, DOE, FEMA, FCC, FBI, Border Patrol, Department of Commerce, and Disaster Communications.

The individual organizations are treated first followed by a frequency-order listing which begins in Part 2 and is concluded in Part 3. I do think Mr. Schaay should not have included the various political statements he inserted here and there in the text but such material does not detract from the excellent technical data contained in the volumes.

The cost is \$12.95 for each part and they are available from Universal Electronics, Inc., 4555 Groves Rd., Suite 13, Columbus, Ohio 43232. Include \$2.00 for shipping/handling for the first book and \$1.25 for additional books.

The third book was the 4th Edition of *Guide to Utility Stations* by Klingenfuss and was a welcome update to the edition I had which was now a couple of years old. The 4th Edition includes the 12th Edition of *Guide to Radioteletype Stations*, so you have the contents of both titles within one volume.

The price for the Guide is \$21.95 plus \$2.00 shipping/handling. This book is likewise available from Universal and all three publications that I have mentioned are also carried by other MT advertisers.

Several more instances of the "bubbly" type transmission I have previously commented about were observed recently. The first took place on 25 June at 1838Z on 14501 kHz. Again, the signal occupied approximately 10 kHz and was somewhat weak with slight fading. On 27 June at 1356Z the same type signal was heard on 2102 kHz and also on 2146 kHz.

Traffic consisting of 5L code groups intermixed with French plaintext was seen on 15736 kHz on 24 June at 1253Z. Here is a representative sample: STOP PRIERE GIFOM ADSEF ET BURIP SLUSE DE PHILIPS STOP ERKEK EKLOT 12/4/86 PAR ACDUS FOKTO etc. etc. Operator

JUNE 1986 LOGGINGS

KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
2640	270258	USB/Several OM conversing in EE re night fishing activities
2696	270302	USB/CG Cutter Thunder Bay in comms with uniden shore stn
4236	270305	CW/de EDF (Aranjuez, Spain)/ Calltape
4258	270307	CW/CQ DE WLO (Mobile, AL)/ Trc list
4272	240135	RTTY 75-850/ Coded WX
4302	270310	CW/DE GYC (Whitehall [London] Naval Rdo, England) V marker
4330	270321	CW/mv Sky Hawker from WCC (Chatham, MA) ETA & boarding of pilots
4400	240138	USB/OM-EE sez he will call in 30 mins on 8291 kHz. Other end not hrd.
4473	240140	USB/Sounds like Mil net with tactical calls (phonetics)/ Vy weak sigs/ EE lang
4490	240143	RTTY 50-425/ Coded Wx
4494	201002	USB/KATO THIS IS GREEN HORNET/ Asks for sig report and authentication.
4606	270317	CW/57YBP DE 41DEL (Spain Naval stns?)
4635	240146	CW/DE SPW (Polish alloc)/ Calltape
6250	240133	RTTY 75-850/ 56UAZ DE 58JDQ (Spain Navy stns?)/ RY's
6395	200956	CW/DE ZLB (Awarua, New Zealand)/ QSL's for msg apparently just concluded
6251	240152	USB/YL & OM-EE conversing re contact to be set up for around midnight.
6604	240154	USB/WX in English for Canadian loc.
81884	240130	CW/DE TBO2 (Ismir Naval Rdo, Turkey)/ calltape
82359	240127	USB/One end of conversation in Italian
11244	260014	USB/Military Air, WX vicinity of Phoenix, AZ
13364	261614	CW/DE DFN36 (Prob Frankfurt, FRG)/ Press in German
13382	292005	CW/DE GFT (Bracknell, England**)/ VVV marker
13935.2	271859	CW/CLP24 (uniden) DE CLP1 (Havana)/ MINREX frequency
14754.5	271848	CW/Stn sending 13920 over and over. Prob telling other end to shift freq.
16346	292011	RTTY 50-425/ Prensa Latina (Cuban News Agency) Press in English
16728	222120	CW/CLA32 DE 9SLC2 (Havana from Zaire ship)
17158	241839	CW/No calls/ 4F grps, sends zero as letter O/ vy weak sign, no ident
17159	241320	CW/ANSA - Italian Press Service/ Press in Italian
18628	222108	CW/CLP45 DE CLP1 (CUBAEMB Luanda, Angola, from Havana)/ MINREX frequency/ Havana told other end to QSY 19990
18762	222102	RTTY 50-75-850/ WX in English, Gulf area
19210	292312	RTTY 50-850/ EEG (rptd over & over) Possibly Spain alloc.

chatter was in the Spanish language.

Two OM/SS on USB were listened to on 6665.6 kHz on 26 June at 0033Z and one station was sending a cipher group message and repeating each letter twice. The phonetic alphabet being used had the word NICARAGUA for the letter N.

A typical 5L group looked like this: LIMA LIMA NICARAGUA NICA-RAGUA OSCAR OSCAR LIMA LIMA WHISKEY WHISKY. Upon completion of the message he went into traffic with 5F groups and each number group was repeated twice. The signals were weak with very bad QRN.

Another frequency was discovered with traffic similar to that reported in the April 1986 Utility Intrigue column. The traffic has the characteristic repeated Z's utilized as separators for portions of the message.

The textual material following the Z's is enciphered and breaks out as garbage on the video monitor. This RTTY transmission is 50-425 and was intercepted on 14810 kHz on 26 June at 1958Z. Operator chatter was in the Spanish language.

The other end was found on 19639.8 kHz initially but he later apparently QSY'd to a frequency somewhere in the 14 MHz band and I did not locate him again. You will recall that this was the activity which has the addressee(s) enciphered in a simple substitution cipher system.

I believe the transmitter call was CBV (Valparaiso Radiomartima, Chile) and he was sending 5L groups but it took me awhile before I realized the special character he was sending was an accented E. Instead of the normal E (dit), he was sending . . . (sounds like UI) and one instance of an accented A (AA) was also heard.

For identification purposes here is a sample heading: CBV NR 025 R 261321 58 BBIIS SRRCC BT TEXT etc. The two 5L groups in the heading are apparently some type of a crypto system indicator with the indicator letters repeated as a means of reducing problems that might arise from garbled reception of the indicator letters. This activity was monitored on 27 June at 0340Z and was hand sent CW on 6860 kHz.

Some more Cuban MINREX activity was picked up on 13384 kHz

GLOSSARY OF COMMONLY ENCOUNTERED UTILITIES ABBREVIATIONS

CALL TAPE	Recorded message sent repeatedly to alert recipient
CC	Chinese Language
CHARAC	Characters
CIPHER	Encrypted plaintext
COMINT	Communications Intelligence
COMMS	Communications
COMMSTA	Communication station
C/S	Callsign
CUT	
NUMBERS	Abbreviated Morse characters for number; Letters are sent for numbers, e.g., T for Zero.
CW	Morse Code (Continuous Wave) transmission
DE	Morse code designator for "This is _____"
DIP	Diplomatic
DTOI	Date/Time of Intercept
EE	English language
EMB	Embassy
GG	German language
GRPS	Groups
LSB	Lower sideband
MARKER	Any continued or repetitive signal sent to keep frequency occupied
MCW	Modulated continuous wave
MFA	Ministry of Foreign Affairs. In Latine American traffic MFA is usually indicated as MINREX.
MSG	Message
OM	Old Man (male operator)
PLAINTEXT	Unenciphered message
P/P	Phone patch
POSS	Possible(ly)
PREV	Previous(ly)
PROB	Probable(ly)
PT	Plaintext (unencrypted)
Q SIGNALS	QRK Readability
	QRM Interference (Man made)
	QRN Interference (Static)
	QRU Nothing for you
	QSL Acknowledge receipt
	QSY Change frequency
	QTC Have traffic for you
QUICK BROWN	
FOX ("QBF")	Radioteletype test tape
RTTY	Radioteletype transmission
RY'S	RYRYRY...Radioteletype test tape
SS	Spanish language
STN	Station
TFC	Traffic (message)
UNIDEN	Unidentified
USB	Upper sideband
VOLMET	Flight weather
W	With
WRKG	Working
WX	Weather
YL	Young Lady (female operator)
5F, 5L GRPS	5-Figure, 5-Letter groups

on 26 June at 1638Z. This RTTY signal was 75-425 and CLP1 (Havana) was working the Cuban Embassy in Nicaragua. The Nicaraguan end was unheard.

The traffic was the usual enciphered transmissions with repeated Z's as textual separators. At times it appeared that there was a swishing type signal superimposed on the frequency.

I have not figured out just exactly what this signal was: On 19214 kHz I heard a CW marker of A on one side of zero beat and N on the other side. It would appear to be an aeronautical navigation beacon but what it was doing on that frequency, I can not answer.

The signal was received at very good strength and while it ran for over an hour, I did not determine any identification for the transmission. I have repeatedly checked the frequency to see if I could pick up the signal again, but to date I have not had any luck.

A few more unidentified RTTY transmissions have been noted, a QUICK BROWN FOX tape ran for a long time on 14874 kHz on 30 June. It was first heard at 1302Z and was 50 baud, 850 Hz shift.

The other mystery station was intercepted 30 June at 2306Z on 10857 kHz and was 45-425. This station ran nothing but RY's and after a considerable period of this, local QRM clobbered the frequency and I dropped it.

MT'S FAMILY OF WRITERS:

Don Schimmel

Don first saw the light of day in Milwaukee, Wisconsin, in 1927. (His wife insists he really still has not seen the light of day.) After Navy Boot Camp in 1944 at Great Lakes, Illinois, he attended the U.S. Naval Training School (Radio) at the University of Wisconsin in Madison.

Upon completion of the course, he went to the Philippine Islands where he was assigned duty aboard a Destroyer Escort (DE). His tour of duty in the Pacific took him to various locations in the Philippines, Okinawa, Korea, and China before returning to the U.S.

In 1946 he was assigned to a Communications Ship (GC) which participated in Operation Crossroads, the atomic bomb tests at Bikini Atoll, Marshall Islands. At the conclusion of the tests, various Pacific Islands were visited and then it was back to the States.

In 1947 Don was transferred to a High Speed Transport (APD) which carried an Underwater Demolition Team (UDT) to conduct some special demolition exercises.

His next transfer was to another APD and again, UDT personnel were aboard. This time the destination was Alaska via the Inland Passage for UDT Cold Weather operations.

After his discharge from the Navy in 1948, he attended the Milwaukee School of Engineering, taking Electronics Technician courses. From 1951 to 1977 he was employed by the U.S. Government and served in a variety of communications-related positions.

During his federal career he spent ten years in Central/South America and had many temporary duty trips to Africa, Far East, Middle East, and Latin America.

His initial SWL interest was in SW Broadcasting, but this took a back seat as he became more engrossed in monitoring utility transmissions.

He has been hosting the "Utility Intrigue" column for *Monitoring Times* since early 1984. He also does other writing including a monthly column in *Popular Communications*.

Don has been married to his wife, Jane, for 35 (hectic, she says) years. They have five children, a daughter, four sons, and six grandchildren--two girls and four boys.

Don's monitoring position includes two Kenwood R-2000's, one Collins 51S1, one Kenwood R-600, Grove Minutuners, MFJ-959 Antenna Tuners, a homemade antenna switching arrangement, Heathkit IM-4100 Frequency Counter, BMC Video Monitor, Frederick 1202RB FDM Demodulator, INFO TECH M-600 Demodulator, SX-200 Scanner, MFJ SSB Filter, Grove Scanner-Filter III, cassette tape recorder, 4 track reel/reel tape recorder, a QWIP 1200 FAX, and a backyard full of receiving antennas--dipoles, longwires and whips.



"Utility Intrigue's" editor Don Schimmel, wearing conservative clothing, at his monitoring post.

The operator chatter was in Spanish and the cipher groups were 5L (cut numbers). The numbers 1-0 were represented by A U W M I R G D N T. At one point the transmission of the message was interrupted while the transmitter was changed and the message was resumed. This activity was on 18638 kHz on 22 June at 1748Z and was in the CW mode.

Cipher groups of an undetermined length were copied on 13868.4 kHz on 30 June at 2101Z. The characters were run together and the CW operator was making frequent repeats of groups so my copy was very choppy.

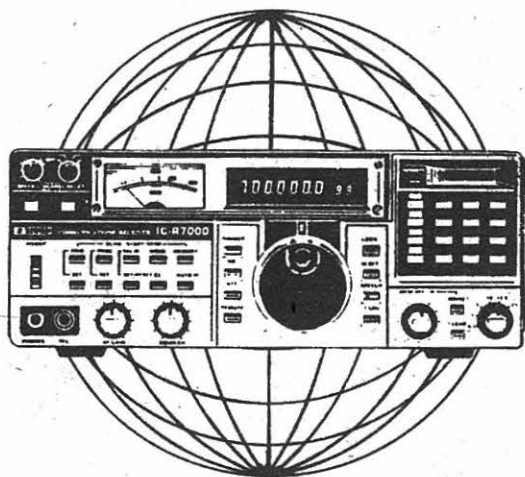
The other end was not heard at this time but I did later hear at 2108Z another CW station on 14650 kHz and this hand-sent cipher traffic

might very well have been the other end. I did not check it out because I had my other receivers set up on other targets.

I only monitored this traffic briefly because shortly after I ran across the RTTY signal (50-425) on 13418 kHz, the transmitting station sent QRU and went down. However it was possible to identify the traffic as being romanized North Korean plaintext. The time of intercept was 2000Z on 29 June.

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HAMS AND THE MIAMISBURG DISASTER

Shortly after 4:30 pm EDT on July 8, 1986, a 44-car freight train heading through Miamisburg, Ohio, and carrying everything from cars to chemicals hit a rail that was buckled by the day's heat and derailed. The train lost its final four cars--one of the cars contained new automobiles, another animal fat, another newsprint, and finally a car containing white phosphorus.

Shortly thereafter a huge fire began spewing a poisonous white cloud soon engulfed the city of Miamisburg, and spread east towards the communities of West Carrollton, Moraine, Kettering, Oakwood, and Dayton.

Most people who were traveling home in the rush hour traffic did not know that anything was wrong. My son and I were returning to our home in Kettering when we encountered the cloud at the southern fringes of Dayton. I did have a bit of advantage over most of the general public as I heard some of the initial activity over amateur radio.

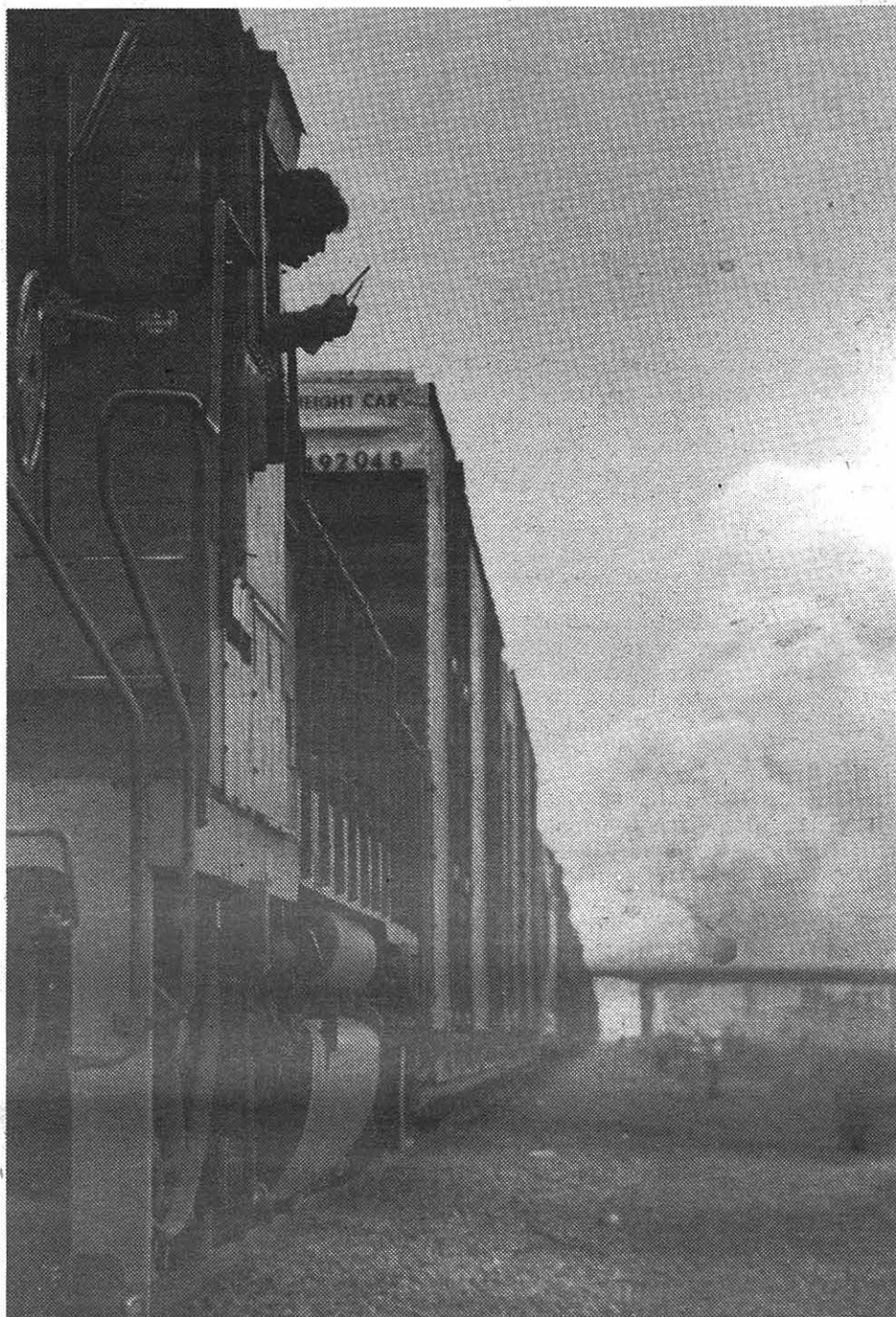
By the time we reached home we had driven through the heaviest part of the smoke. We knew what was

happening but many people still did not get the message. I can remember watching joggers in Oakwood in the midst of the smoke, which could cause anything from skin irritation to breathing problems.

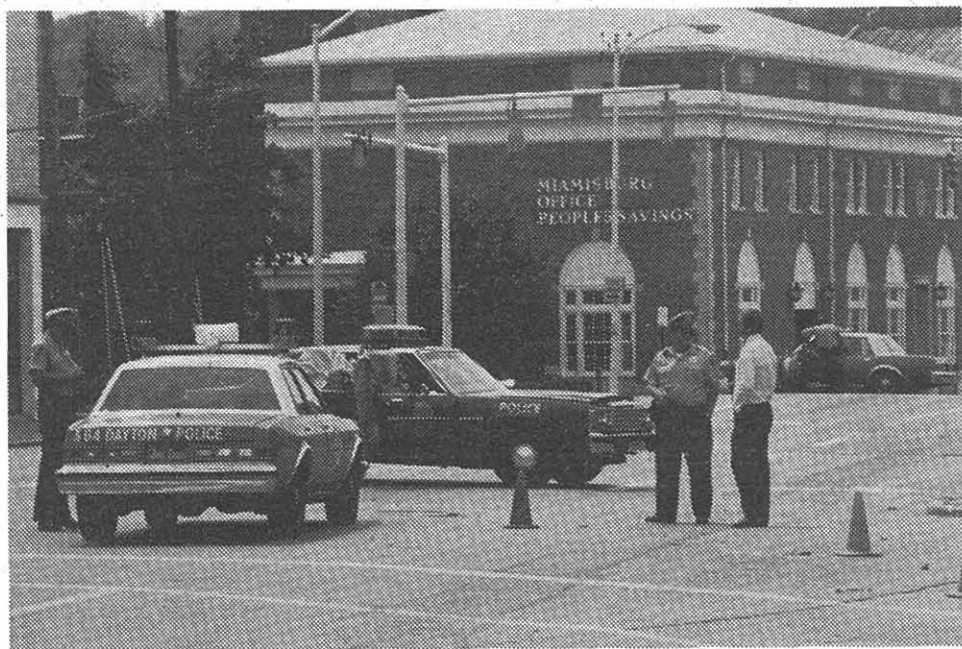
The public finally did get word when the Dayton EBS (Emergency Broadcast System) tones were placed on local radio and TV stations. By the time I got home the local TV crews were rapidly approaching the scene, one with live helicopter coverage.

Since our section of Kettering was not in the cloud of smoke, we did not have to worry about evacuation; however, it was a prime opportunity to bring out the scanner to listen to real-life radio communications in a disaster situation. The Miamisburg train wreck provoked the largest evacuation in history caused by a train accident.

Some of the more obvious frequencies were programmed into the scanners--the police and fire frequencies for the locations covered by the cloud, as well as the Ohio Disaster Service frequency and a host of mutual aid frequencies.



Railroad official uses walkie-talkie to communicate with fire scene at rear of train (Photo by Jeff Cope)



Police blockade barricades the disaster scene (Photo by Jeff Cope)



Civil Defense officials discuss evacuation plans (Photo by Jeff Cope)

One group of frequencies I initially overlooked were the amateur radio frequencies; It was these frequencies that eventually gave me the most information on the situation.

The Miamisburg disaster lasted from July 8th through the 12th for a total of 93 hours of declared emergency. The EBS system in the Dayton area was activated several times throughout the situation.

The two-meter repeater on 147.195 operated by the Monsanto Amateur Radio Association (MARA) was the prime communications channel for the volunteer amateurs that poured into Miamisburg to assist in any way they could, alerted only ten minutes after the accident.

It was ironic that less than two weeks earlier members of MARA went through a special field day event where a mock disaster was simulated by the club members. However, this time the members of MARA went into a real-life disaster. No simulation. No time to run back home and pick up something that was left behind.

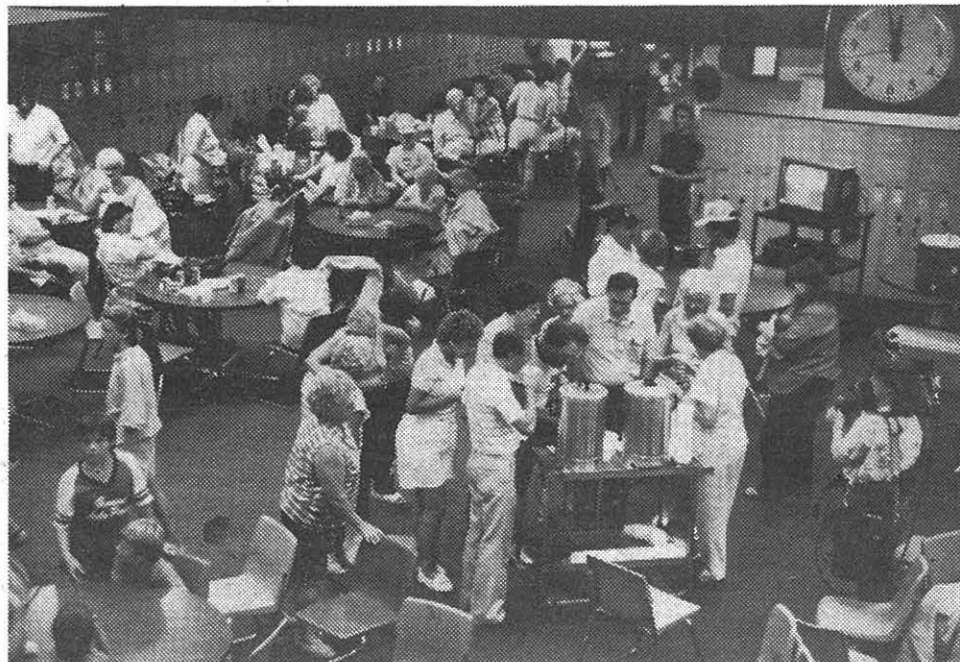
The group immediately made themselves available to police, fire and city officials to offer additional communication lines through their amateur radio facilities, including a portable station at the Miamisburg Police Department dispatch center.

A MARA member was assigned to the fire chief to provide additional communications as well as another amateur assigned to the head of the local Civil Defense Agency.

When evacuation orders were put into effect MARA members rode with many of the out of town police officers to assist them through unfamiliar streets. They also rode with the Miamisburg Police officers in order to communicate on the flow of evacuation traffic as well as the progress of the cloud as it moved through Miamisburg.

The MARA group was not alone; the disaster brought in help from hams as far away as Columbus and Cincinnati. The Dayton Amateur Radio Association brought in a large radio-equipped van for members to work from.

At Sycamore Hospital, a special amateur station was set up near the emergency room in case the facility had to be evacuated. The hospital maintenance crews increased the pressure of the air system in the facility and thus, when doors were opened, the air would flow out. The facility did not need to be evacuated.



Residents wait at this Miamisburg High School emergency shelter (Photo by Jeff Cope)

Other amateurs were stationed at Miamisburg High School and the Dayton Convention Center which were used as evacuation centers. Still other amateurs were stationed at Monsanto (a DOE facility) and provided wind direction and speed reports every quarter of an hour.

Even the amateur station located at Dayton's National Weather Service office got into the act when severe thunderstorms posed a problem for those trying to contain the fire.

All in all, listening to the Monsanto Radio Association two-meter repeater gave me more insight as to what was happening than did any of the public service bands that I was monitoring. The hams were shadowing the firemen, police, EPA officials, DOE employees, and even the state's governor!

Amateurs are, by their very nature, willing to jump in and assist in any way they can. So the next time you are near a disaster situation, whether natural or man-made, be sure to listen to the amateur radio communications. It is here where you will listen in on the real action! ■

Free List of Weather Stations

Want to update your list of National Weather Service broadcasts nationwide? Request the leaflet, "NOAA Weather Radio," publication NOAA/PA 76015, by writing National Weather Service (Attn: W/OM 15X2), NOAA, Silver Spring, MD 20910.

Echo of the Past

VLF monitors may have the opportunity to hear a vintage Alexanderson alternator placed on the air on 17.2 kHz between 1300-1400 UTC (9-10am EDT) September 25, 1986.

The transmission will be directed to the Antique Wireless Association and will originate from station SAQ in Varberg, Sweden. MT would like to hear from listeners who are successful in copying the transmission!

(Courtesy Hugh Miller, Seattle, WA)

Boston Police Select 800 MHz

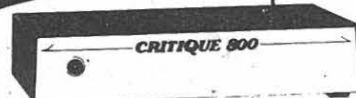
In an effort to avoid the frequency congestion of conventional high and low band communications, and to evade (at least temporarily) the hobby--and criminal--eavesdroppers, New England's third largest police force will switch to 800 MHz within a year.

The new \$2.5 million radio system from Motorola will allow patching of traffic from one frequency to another for mutual aid and will also support phone patches.

The trunked system will be hard to monitor even when listeners happen onto their new frequencies; the characteristic constant switching of the base from one channel to another will be hard to keep up with.

(Contributed by Mark Johnston, Hank Lane, Paul Hopkins, and others)

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(Outer Limits, cont'd from p.35)

other way reacted to radio programming (legal or nonlegal while in Vietnam, please contact the Highland City, POB. Thanks. In Florida, Dave Crawford notes swisher-type jammer jamming Radi

Marti on 11930 at 1830 UTC. From Hawaii, Chuck Boehnke reports reception of Canadian pirate TNFI on 7415 kHz. Pennsylvania's John Demmitt got a QSL from Radi Rebelde for its transmission on 71 kHz, which is designed to jam ant Castro Radio Mambi. Nice goin John!

We have some other goodies from John, but we had best hold them for a future column. Scott and I will have to say so long for now. Thanks for your support!

Got a friend who scans?

Why not make his day (or hers) and introduce him to **Monitoring Times** as a gift subscription?! There's no **Times** like the present!

HIGH SEAS

James R. Hay
141 St. John's Blvd.
Pointe Claire, P.Q.
Canada, H9S 4Z2

'DX'ing the Arctic

Summer is the season for Arctic DX, an interesting and challenging aspect of our hobby and, although the sunspot cycle is at its low, the challenge remains.

During the summer months, the weather warms up enough for ships to get into the northern ports, particularly those on Hudson's Bay. This activity allows SWL's a chance to hear some of the coast stations and ships in the Arctic.

Starting in the east, around Hudson's Bay, one will find Killineck, N.W.T. (VAV); Frobisher Bay, N.W.T. (VFF); Coral Harbour, N.W.T. (VFU); Inoucdjouac, P.Q. (VAL); Poste-de-la-Baleine, P.Q. (VAV); and Churchill, Man. (VAP); and the northernmost station at Resolute, N.W.T. (VFR).

All of these stations are equipped to handle messages and all but Killineck, Inoucdjouac and Poste-de-la-Baleine have facilities for duplex telephone calls. All of the stations have 2182 kHz and Coral Harbour is equipped with 2514 kHz; the rest have 2582 kHz. Due to the limited amount of traffic which they handle Inoucdjouac and Pose-de-la-Baleine do not have any other frequencies.

The remaining stations, for longer range communications, do have other frequencies including some CW channels. For the moment only telephony frequencies will be discussed. All stations (except those with only 2 MHz frequencies) have 4376.0 kHz.

Resolute is also equipped with 8793.3 kHz, and Frobisher Bay has four other frequencies; 6512.60, 8753.9, 13100.8 and 17335.2 kHz. As can be seen, Frobisher Bay is the major communications station in the eastern Arctic.

For those proficient in code, the telegraphy frequencies will be of interest. Churchill, Coral Harbour, Cambridge Bay, Killineck and Resolute all have 500 kHz as well as one other LF frequency:

VAF Churchill	420
VFU Coral Harbour	416
VFF Frobisher Bay	430
VGW Killineck	484
VFR Resolute	474

In addition, Frobisher Bay also has 4236.5, 6493, 8443 and 12671 kHz. The Port of Churchill uses VHF frequencies of 156.400, 156.550 and 156.600 MHz for port operations.

In the western Arctic, information about the various oil-company frequencies is quite hard to come by; however, two frequencies on which bases and/or oil rigs have been heard are 16377 and 13420 kHz USB.

In the Athabasca-McKenzie River area there are five stations which operate on the frequency 5803 kHz USB:

VFF 7 Fort Chipewyan, Alta.
VFF 6 Fort Simpson, N.W.T.
VFH 3 Hay River, N.W.T.
VFH 8 Norman Wells, N.W.T.
VYO21 Tuktoyaktuk, N.W.T.

Hay River is also equipped with 156.800 and 161.800 MHz.

The Canadian Coast Guard operates three other coast stations in the Arctic: VFC Cambridge Bay, VFU6 Coppermine and VFA Inuvik; N.W.T. Inuvik and Cambridge Bay also have 2598 kHz and 5803 kHz. Inuvik, in addition, has 6335.5 kHz and the same two VHF frequencies as Hay River. Two telegraphy frequencies are in use at Cambridge Bay: 6351.5 and 12671 kHz.

Alaska offers something to those who are interested in northern DX and who live on the west coast: Along with communications stations, there are also several Naval and Coast Guard stations.

For those in Alaska, 161.900 and 162.009 MHz will offer Public Correspondence traffic from stations too numerous to mention here. On the MF there are some stations which can be heard in the southern areas when conditions are right.

All of the following stations will have 2182 kHz in addition to their working frequency: WKR Home and WGG 58 Juneau are both using 2499 kHz; WGG 53 Cold Bay and WDU 29 Sitka are both on 2312; WDU 26 Cordova and WGG 56 Ketchikan are both on 2397; and WDU 23 Kodiak uses 2309 kHz USB.

On HF, 8802.6 and 6509.5 are shared by KWL 43 King Salmon, KWL 39 Fort Walter and KWL 21 Juneau; 4125 is shared by WBH 29 Kodiak, KGB 91 Yakute, KGD 58 Anette, and KGI 95 Cold Bay. Station KXW Anchorage operates on 8291.1 kHz.

The U.S. naval station at Adak (NOX) can be heard on 500 and 450 kHz and Kodiak (NOJ) on 500 and 470 kHz, both in CW as well as on

USB using the following frequencies for Kodiak:

4143.6	6518.8	8718.9
4428.7	6521.9	8765.4
6218.6	8294.2	8768.5

In addition to the many coast stations, it is also quite possible to hear ships in the Arctic. The Canadian Coast Guard uses a fleet of heavy icebreakers during the navigation season to help commercial ships:

CGCW CCGS Camsell
CGDX CCGS Des Groseillers
CGBT CCGS J.B. Bernier
CGGM CCGS Labrador
CGBN CCGS Louis S.St. Laurent
CGBB CCGS Montcalm
CGMZ CCGS Norman McLeod
Rogers
CGSJ CCGS Simon Fraser
CGBK CCGS Sir John A.
MacDonald
CGDT DDGS Sir John Franklin
CGCV CCGS Tupper
CGCG CSS Hudson

One busy CW frequency is 6292.5 kHz.

The following Swedish icebreakers should also be heard in northern waters:

SGDQ Ale
SBPQ Ejord
SCYN Tor
SHPR Atle
SBXQ Oden
SDIA Ymer
SBPT Frej
SCKD Thule

Soviet icebreakers which have been heard in the past few years are:

UISZ Niz Akademik Sergey Korolev
USGH Nisp Passat
UMAY Akademik Shirshov
EREV Misp Ernst Erenkel
EREA Misp Musson
EWVS NPS Professor Mesyasev
UUYC Morzhovets
UUYZ Nis Menel
UHQS Akademik Korolev
UIVZ NIS Kosmonaut Vladislav Volkov
UZZV Nis Kosmonaut Georgiy Dobrovol'skiy
USPO MPS Akademik Knipovich
UKFI Nis Kosmonaut Yuruy Gregarin
EWWJ Arktika
ERET Nis Georgiy Ushakov

U.S. Coast Guard ships which can likely be heard from Alaska include:

NRPN USCG Ironwood
NLBH USCGC Cape Romain
NODL USCGC Firebush
NRUC USCGC Storis
NHKW USCGC Confidence
NRFY USCGC Flametree
NODU USCGC SEDGE
NRFJ USCGC Northwind
USCGC Sand Tracker
USCGC Cape Coral

Cruise ships which visit the Arctic include:

GCCG Cunard Princess
SKMW Lindblad Explorer
>JSU Rotterdam
PJSF Statendam
LFSA Sagafjord
ELBM9Tropicale
Daphne
Island Princess
Sun Princess
Pacific Princess (the "Love Boat")

Other ships which may be heard include:

VG7841 Robert LeMeur
VOBJ Fred J. Agnich
VCLM N/V Arctic
VXMM Arctic Trader
VFBL A.C. Crosbie
VOQB Chesley A. Crosbie
VOTF Sir John Crosbie
VCRJ Irving Eskimo
VCTG Irving Ocean
VYWD Edgar Jourdain
VGLN Irving Arctic
VCLW M/V Mesange
PGEF Neddrill II
CZ3946 Pandora II
VOPV Polar Prince
VGXZ Jos. Simard
VYZJ Luhger Simard
LAPH Skauvann
VGZX Lefrene
HPFO Texaco Alaska
OXKT Arctic Skou
VSBB3 Cast Musk Ox
VPDC United Effort
VRCW Fort Fraser
SQML M/S General Babrowski
Kalvik (icebreakers owned by Kigoriak)
Dome Petroleum

Occasional Visitors

The Arctic Surveyor, Chimo, Bill Crosbie, Esso Gjoa, Explorer II, Eastern Shell, Freedom Service, Riving Birch, Irving Cedar, Pacnorse, Pelerin, Pioneer Service, and Charles de Vanier are some of the ships which have been to the Arctic in the past few years; many of them make trips regularly each year.

Other than the icebreakers the ships are involved in the oil industry, supplying northern villages, picking up grain from Churchill to take to Europe, or are from some of the northern mines such as that at Nanisivik.

From now until November is the Arctic shipping season, so there's no time like the present to try for Arctic DX.

For those interested in reading regularly about Arctic and Antarctic DX, the Canadian International DX Club has an Arctic DX column in its monthly newsletter. A sample issue is \$1: CIDX, 6815 - 12 Ave., Edmonton, Alta., Canada, T6R 3J6. My thanks to Bob Curtis, editor of *Arctic DX*, for providing some of the information used in this article.

Your correspondence is always welcome. Comments and suggestions may be sent to the address in the masthead.

SIGNALS FROM SPACE

Larry Van Horn
160 Lester Drive
Orange Park, FL 32073



The GOES Weather Satellites

Most space buffs by now are keenly aware of the GOES-G launch failure aboard a Delta rocket launched May 3 from Cape Canaveral. This has caused some difficulty for NOAA/NESS in gathering weather satellite imagery. The following is the latest information available at deadline on U.S. Geostationary Spacecraft status.

GOES-2 (Central) - WEFAX services are on 1691.0 MHz. Communications continue in good working order. The inclination angle (4.404°) continues to increase with insufficient fuel to correct this increase. There are no immediate plans to change the spacecraft's position, located at 112.66°W . A broadcast schedule is contained in the 1120Z transmission.

GOES-3 (West relay) - Direct readout of "stretched" VISSR data (from GOES-6) is on 1687.1 MHz and WEFAX is on 1691.0 MHz. Communications continue in good working order. The satellite, with an inclination angle of 3.236° , is located at 136.54°W and has insufficient fuel to correct the inclination angle. A broadcast schedule is contained in the 1225Z transmission.

GOES-4 (ESA/Non-operational) - GOES-4 (located at 43.24°) is under control of Wallops Island and is used to support the Data Collection Services (DCS) or the European Space Agency (ESA) that are normally relayed via METEOSAT. The inclination angle is 2.7° .

GOES-5 (East relay) - Direct readout of "stretched" VISSR data (from GOES-6) is on 1687.1 MHz and WEFAX is on 1691.0 MHz. A broadcast schedule is contained in the 1120Z transmission. Communications continue in good working order. It has an inclination angle of 0.086° and is located at 75.39°W .

GOES-6 (Imaging Spacecraft) - WEFAX or "stretched" VISSR data services are not available from this spacecraft. "Stretched" VISSR data from GOES-6 are relayed through GOES-5 in the east and GOES-3 in the west. The spacecraft was repositioned November 24, 1985, at 107.89°W to support winter storm operations.

The inclination angle is 0.92° ; however, on June 19, 1986, it started movement at $1/2^\circ$ per day and was stopped July 9, 1986, at 98°W to support summer hurricane/severe weather operations.

The United States still has only one Geostationary Operational Environmental Satellite (GOES) capable of imaging. One May 3, the Delta rocket carrying a new satellite into orbit for NOAA shut down after operating for a little over a minute. The satellite that the Delta was carrying was the GOES-G satellite.

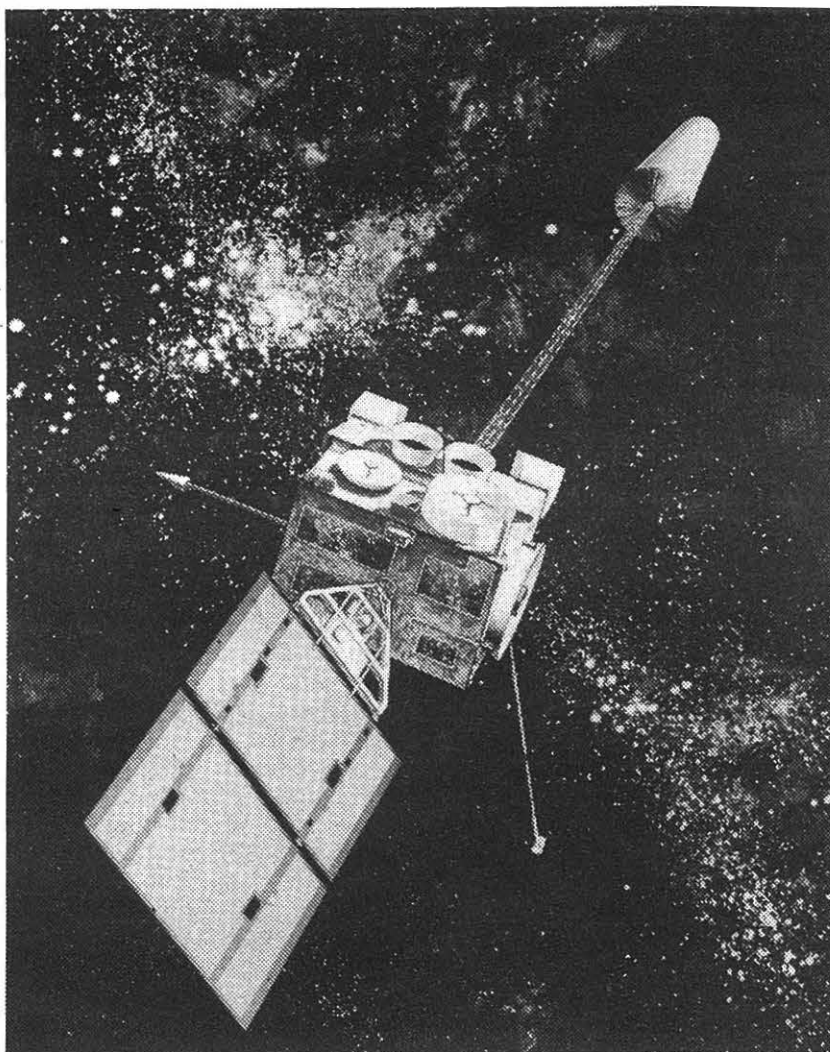
The loss of GOES-G is a serious setback to the program. The satellite was intended to bring the nation's geosynchronous weather satellite system back to full force after a nearly two-year hiatus. The Delta veered off course and was destroyed by command from the Eastern Test Range, Range Safety Officer.

The GOES provides an image of the clouds in the atmosphere every half hour for the entire hemisphere under their view. They are the key means for tracking tropical storms and following the outbreak of severe weather such as thunderstorms and tornadoes throughout the United States.

Ordinarily, NOAA operates two geosynchronous weather satellites - an eastern satellite which covers the entire Atlantic and a western satellite which covers the Pacific. Since July 1984, when GOES-5 failed, NOAA has been operating only one satellite, GOES-6, over the center of the United States by moving it somewhat to the east in summer and the west in winter.

GOES-6, the single imaging satellite in orbit, is three years old, and has a design life of five years. If it continues to operate normally, it will have enough fuel for two more years of operation. If the instruments continue to perform, it is possible that the satellite could give some coverage for four more years. Previous satellites of this design have survived only two to three years; however, the design flaws that caused those early failures have been corrected on both GOES-6 and GOES-H.

GOES-H, the last of the series, will be available for launch later this year. The launch schedule will be re-evaluated based on the new situation and the now uncertain time that the Delta launch vehicle could be certified ready. The next series of satellites, GOES-I through GOES-M, will begin coming off the assembly line in 1989 or 1990. They will have an improved design and require the Shuttle for launch.



Artist's rendering of the new generation GOES - (Courtesy of Ford Aerospace)

Meantime, NOAA will explore what intermediate steps might be taken to assure continued accurate observations and forecasts. NOAA will continue to monitor severe storms with its existing geostationary and polar-orbiting satellites GOES-6 and NOAA-9. This observational capability is supplemented over the Atlantic by the European Space Agency's Meteosat, and over the Pacific by the Japanese National Space Agency's satellite, GMS.

There appears to be more satellite BBS activity than I was aware of. Several MT readers have written about BBS activity all over the country that I will summarize below.

John Williams reports on a Celestial RCP/M BBS in the capital of the Lone Star state, Austin. The board is 24 hours a day, 300 or 1200 baud and has satellite tracking software that can be downloaded on the first visit for CP/M systems and the IBM-PC.

The board also includes current NASA prediction bulletins for a variety of weather, amateur and Soviet manned spacecraft. In addition the BBS also includes an on line data base (in dBase II format) containing information on all satellite payloads launched since Sputnik 1. The data base was compiled from such sources as the Nasa Satellite Situation Report and Jane's Spaceflight Directory. This data base is updated twice yearly.

The telephone number for the Celestial RCP/M BBS is 512-892-4180. I would also like to thank David Riippa for providing the same

information.

AMSAT, The Radio Amateur Satellite Corp, also has a BBS. The AMSAT BBS is also in Texas and can be reached by dialing 512-852-8194

If any other BBS are available for satellite discussions, I would appreciate a note with details on the board. You can send it via the address on the masthead.

Faithful SFS reporter, John Biro, reports that the Soyuz T-15 cosmonauts Leonid Kizim and Vladimir Solovov have left the Salyut 7 and returned to the space station 'MIR'. The transfer was completed on June 26. Via the AMSAT New Service, the Salyut 7 is expected to be commanded back into the earth's atmosphere by the time this column is in print. Monitors should listen to 143.625 MHz for voice comms from the MIR space station.

And with John's report, close this month's edition of SFS by welcoming all the new MT reader that have joined us via Larry Miller's fine publication. I hope that you enjoy MT as much as we enjoy bringing it to you. If you are interested in satellite monitoring then SFS is the place for you.

Next month, SFS will bring you some information on amateur satellite groups and the latest in satellite information and frequencies.

Remember to send your satellite frequencies, questions and information as well as military aircraft frequencies to the address printed in the masthead, care of the editor.



HAM RADIO

by Bob Grove WA4PYQ

It's Hamfest Time!

From early spring to late fall, amateur-radio conventions and flea-markets abound across the country. Whether giant indoor extravaganzas like Dayton, or Saturday morning tailgate swapfests in a parking lot, hams and SWL's alike scout for bargains and enjoy the camaraderie.

MT is happy to print hamfest notices as space permits and provided adequate advance notice is given.

SUPERFEST '86 (Peoria, IL); September 20-21, 1986.

Acres of flea market space, satellite TVRO demonstrations, home and professional computer gear, and FCC exams will highlight this hamfest to be held at the Exposition Gardens off the 6300 block of North University on W. Northmoor Road.

For more information write Superfest '86, P.O. Box 3461, Peoria, IL 61614.

FOX RIVER RADIO LEAGUE (St. Charles, IL); October 18-19, 1986.

The new Norris Sports Center, just off Rt. 64 thirty-five miles west of Chicago, will be the site of an elec-

tronic flea market which will include commercial exhibits, scanners, forums, ham radio gear, technical demonstrations, and even amateur radio license exams.

Sellers may set up beginning at 7pm Friday or Saturday and the public will attend Saturday from 10-4 and Sunday from 9-2. Details are available from Bill Heiman, 837 Lebanon St., Aurora, IL 60515 (ph.312-859-1171).

HAMFEST MINNESOTA AND COMPUTER EXPO (Richfield); November 1, 1986

The second annual show sponsored by the Twin City FM Club will be held at Richfield High School, 7001 Harriet Ave. S., from 7:30am-3:00pm. Admission is \$3.

Special guest is Wayne Green W2NSD. There will be a DX seminar, FCC exams, indoor flea market, commercial booths, food, door prizes, other seminars.

For more information send an SASE to Hamfest Minnesota and Computer Expo, Box 555, Minneapolis, MN 55440.

It's Eleventh Hour for Captain Midnight

Captain Video, the satellite TV pirate who accessed an HBO transponder at 12:32 am on April 27, 1986, has been identified after his apprehension as John R. MacDougall, a part-time employee of the Central Florida Teleport uplink station in Ocala, Florida.

MacDougall, owner of MacDougall Electronics, a home-dish vendor, was apparently disturbed by the amount of scrambling taking place on satellite TV channels, curtailing TVRO sales all over the country and leading many businesses to ruin. He decided to use the equipment at his disposal to lodge a protest.

The perpetrator, a licensed extra-class amateur (N4COP), faces a \$5000 fine, the largest ever levied against an individual, according to an FCC spokesman. He also faces serving any remaining time of a one-year prison sentence (suspended for probation) if he violates any of the negotiated terms of the sentence.

The FCC investigation was the

largest ever undertaken by that agency, taking three months to complete. Reams of clues and tips, from taking records and readings of monitoring stations around the country, satellite data, and one tip from a traveling salesman who overheard a conversation at a public telephone booth about "Captain Midnight," had to be evaluated.

Engineers speculated that the uplink must have used substantial transmit power and at least a seven foot dish to override the legitimate HBO uplink signal. They noted that a brief electronically-generated message had appeared on the transponder a week earlier, apparently a preliminary test.

MacDougall was scheduled to appear before a federal judge August 26, 1986, for formal sentencing. In the meantime, his amateur license has been suspended for one year and he awaits the judge's final decision as to whether preliminary sentencing will be carried out.

ARRL Votes Not to Support Privacy Act

The American Radio Relay League, by unanimous vote of the Board of Directors on July 24-25, 1986, has gone on record regarding the Communications Privacy Act of 1986 as follows:

...while (the Act) appears to protect current amateur radio interests in its present state, the Act fails adequately to protect the services it intends to, and represents an unneeded change from current rules that prohibit the disclosure of most encrypted electronic communications. The ARRL does not support the proposed legislation because of these defects.

OSCAR Resuscitated

AMSAT OSCAR 10's on-board computer crashed May 10, 1986, when cumulative radiation damage impacted upon the memory system. The situation looked bleak, indeed.

Karl Meinzer, DJ4ZC, designed a diagnostic program for the memory which produced a map of the damaged cells, enabling technicians to devise a substitute routine around the damaged hardware.

On July 15, AO-10 was brought up successfully, although at a loss of CW and RTTY telemetry. MT applauds the efforts of DJ4ZC, ZL1AOX, W0PN, KA9Q, WD4FAB, W2FPY, and W3GEY for their dedication in bringing the satellite back to life.

Packet Moonbounce Successful

June was the month that W3IKI, operating at Gilmore Creek, Alaska, had the opportunity to connect a 140 watt transmitter to an 85-foot dish, measured to have 38 dBi gain.

Using an AEA PM-1 modem with 200 and 400 Hz shift FSK, a stock TAPR TNC2, a GaAsFET preamplifier on a converter ahead of a Kenwood TS830, and an FT726 exciter into a Mirage D1010N solid-state power amplifier, the 140 watts

RF power became 700 kilowatts EIRP beamed at the moon!

Round trip EME (earth-moon-earth) transmissions took 2.2 seconds, but three day's worth of experiments logged 29 separate QSO's (contacts) with 19 different stations, nearly all of which were stateside. Only one European was heard (OK1KIR) and none from South America, Asia, Oceania, or Africa. (From Gateway, ARRL)

17 Meter Band Still Delayed

Although the WARC '79 conference awarded 18.068-18.168 MHz to the amateur radio service, U.S. government fixed stations still occupy the band and intend to do so until 1989.

The ARRL is investigating possibilities to open unoccupied portions to the amateur service before that time, but so far have been unsuccessful.

California CAP Seeking Hams

The California wing of the Civil Air Patrol is actively seeking licensed amateur radio operators to assist in packet radio experiments. Non-licensed radio enthusiasts are also invited to participate in reception.

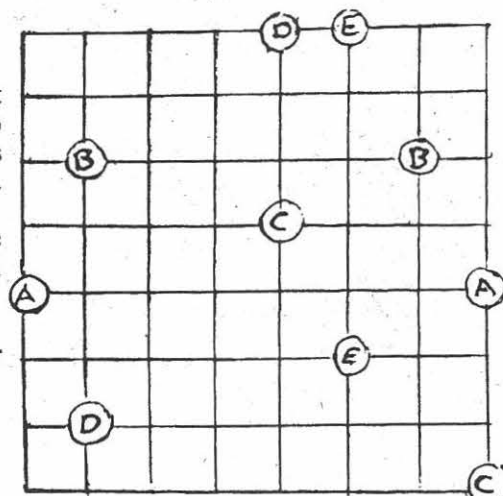
For further information contact captain Mark Schmidt at 916-788-1730.

Got Your Wires Crossed?

K1REC had a printed circuit board as shown. He had to connect wires (following squares neatly) from A to A, B to B, etc.

After some struggle, he made connections. Circuit worked and he's now "one the air."

(Contributed by Joe Strolin; Solution diagram on page 45.)



WHAT'S NEW?

Equipment Shelf



The New PRO-2021 Scanner

One Reader's Impressions

by Larry Wiland, Youngstown, OH

What makes THIS scanner special is its 200 (yes, TWO-HUNDRED) channel capability. Channels are arranged in ten banks of 20 channels each which may be scanned singly; in banks of ten (one or several random user-selected banks), or even all 200, in any user-selectable combination.

Yes, 200 channels take a long time to scan, but if you live in Cleveland; New York or Chicago, there are certainly enough channels to fill all the slots. This is a godsend to monitors who formerly had to use multiple-scanner setups to "hear it all."

The PRO-2021 prices out at \$299.00 (not unreasonable) and programs/searches in the manner of other Radio Shack scanners. It has a bright, bluish-green backlit L.C.D. channel display.

The radio is approximately the size of a Bearcat 210 and has features like programmable priority which can

be set to ANY channel, not just channel one; channel lockout; bank lockouts, and speed selection. An unusual feature is the "monitor" function which gives you ten temporary channels in which frequencies found during the search mode can be stored temporarily until they are assigned a permanent memory in one of the other 200 channels.

The radio can be used as a base or mobile unit and comes with all hardware for both applications. A 9-volt battery maintains memory in event of loss of power.

Frequency coverage (MHz) is 30-54 low VHF, 108-136 AM air, 138-174 VHF high, and 380-512 UHF. Sorry...no 800 MHz. Audio is clear and the radio is very sensitive. I noticed little intermod and a few birdies, but would recommend the new Radio Shack PRO to anyone who wants a darn good scanner for a reasonable cost. I'm very pleased with mine!



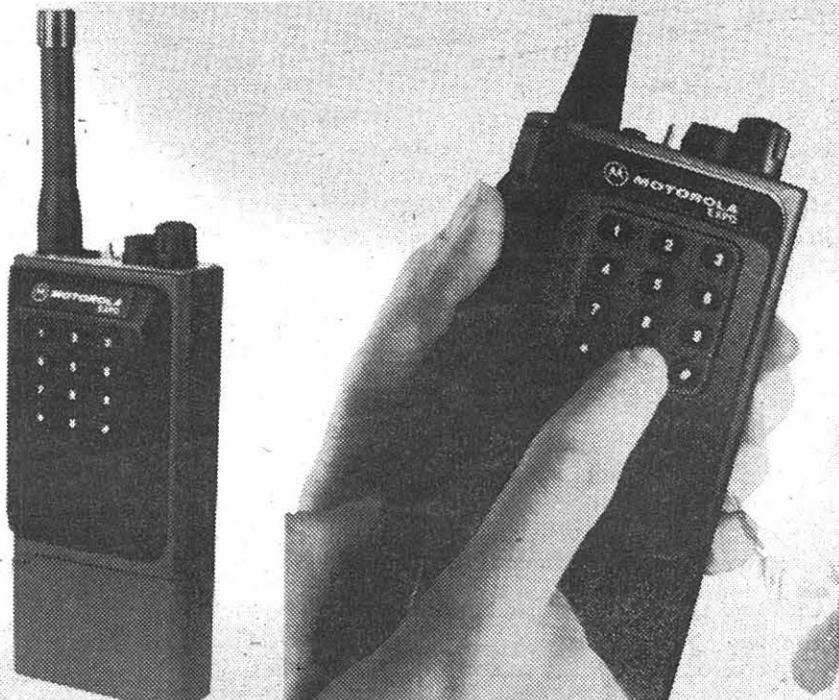
Realistic PRO-2021

Motorola Unveils Tiny Talkie

Described by the manufacturer as "dramatically compact," the new Motorola "Expo Touch Code" series handie-talkie measures a scant 5-3/4" x 2-1/2" x 1-1/4" and weighs in at 13.8 ounces.

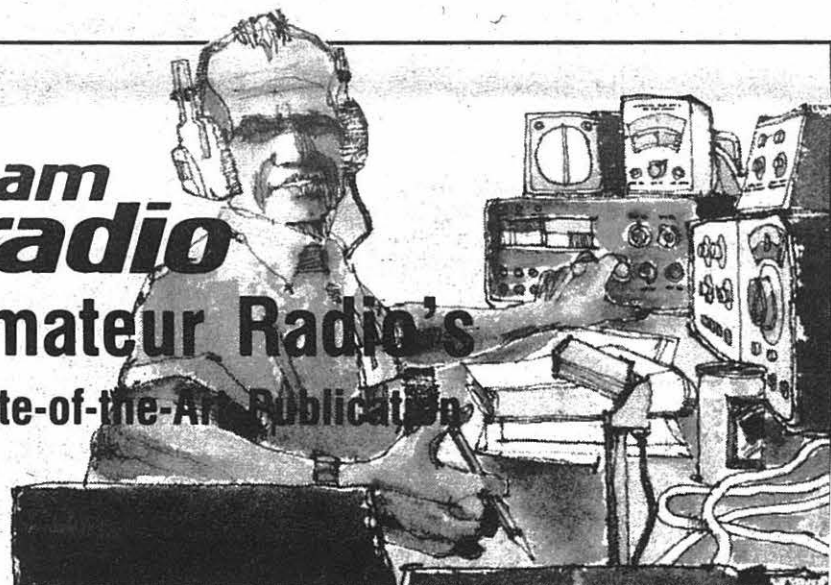
Available for VHF or UHF,

portables offer DTMF encoding for various telephone interconnect requirements. For further information contact Barbara Bennett at Motorola Communications Sector SH5, 1301 E. Algonquin Rd., Schaumburg, IL 60196.



Motorola Expo Touch-Code Series

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And there's more! Monthly columns by: Joe Carr, K4IPV on the ins and outs of repairing and troubleshooting your radio; Bill Orr, W6SAI on antennas and antenna technology plus a lot more; noted HF/VHF operator and DX'er Joe Reisert, W1JR's world of VHF and UHF technology; Ernie Guerri, W6MGI on new trends in electronic technology; our own investigative reporter, Joe Schroeder, W9JUV with Presstop, your inside view to what's going on in the world of Amateur Radio; and noted government propagation expert Garth Stonehocker, K0RYW on propagation.

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New FAX Demodulator from DES

Digital Electronic Systems (INFO-TECH) has announced the imminent introduction of a new facsimile demodulator for short wave and satellite use. Labeled the model M-800, the FAX unit carries a recommended retail of \$599 but will be available at a discount from MT advertisers including Grove Enterprises and Universal Shortwave.

Many services including press agencies, federal government, military, and marine broadcast weather maps, newsphotos and other graphic information are available on the short wave spectrum as well as satellite frequencies.

Requiring a dot matrix printer, the M-800 is plugged into the audio output jack of a receiver which is tuned to the signal and it automatically prints out the picture.

Standard drum speeds of 60, 90, 120, and 240 RPM may be selected, positive or negative polarity, right to left or left to right print direction. The M-800 is designed to interface directly with an Epson FX-85, LQ-800 or equivalent dot matrix printer with an 8" carriage.

We will have more on the M-800 when it becomes available for an MT in-depth review.

NEW SCANNERS FROM RADIO SHACK

The Tandy Corporation has decided not to let Uniden and Regency get away with the scanner market--no fewer than five new programmable models have been announced in the fall catalog.

Of particular interest to serious VHF/UHF monitors is the PRO-2004, a 300 channel programmable base/mobile scanner featuring continuous frequency coverage from 25-520 and 760-1300 MHz, obviously a remarkable replacement for the popular--and temporarily, at least, discontinued--Regency MX7000.

Measuring approximately 3" x 10-1/2" x 8-3/4" and including scan, search, speed, and delay functions, the 2004 is slated for a late fall introduction. Price is set at \$399.95.

The PRO-2021 (\$299.95) has priority, lockout, two speeds, and 200 memory channels. Frequency coverage of this desktop scanner is 30-54, 108-136, 138-174, and 380-512 MHz (see review on p.43).

At \$199.95 the PRO-2010 features scan, search, delay, lockout, priority, 20 channels of memory, and frequency coverage from 30-54, 138-174 and 380-512 MHz.

Hand-Helds

The top of the line PRO-32 hand-held programmable scanner is clearly ahead of the competition so far as features are concerned (see review this issue), sporting 200 memory channels in 10 selectable banks--up to 210 memorized channels including the monitor memory.

Lockout, search, keyboard lock, priority, and many other features along with frequency coverage of 30-54, 108-136, 138-174, and 380-512 MHz make this a hot contender for only \$299.95.

A low-end, four-channel crystal portable scanner, the PRO-26 uses four AAA penlight cells and covers 30-50, 144-174 and 450-512 MHz. Only \$99.95



No-frills, basic scanner aptly describes the new PRO-2011



The PRO-2010 has only 20 memory channels, but offers considerable functional flexibility.



Radio Shack's new PRO-2004 offers advanced functions, including 200 memory channels and continuous frequency coverage.

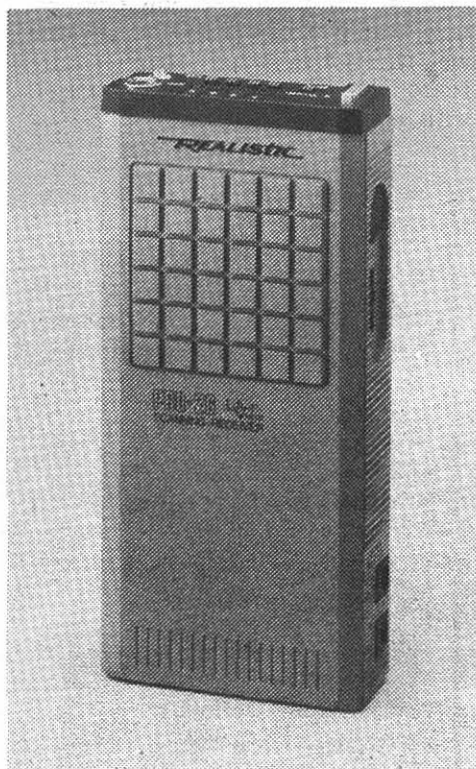
Smart Radio Stays Tuned In

Drivers in Great Britain will no longer have to fumble with the dial of their radio if the British Broadcasting Corporation has its way. The BBC has developed a radio that ensures that once a station has been selected, the radio will stay tuned to it, even if the transmission frequency changes. The device, devised for reception of standard domestic radio, will be particularly useful for car radios, according to an article in the *London Observer*, where listeners frequently travel between the areas of one transmitter and another that use a different frequency.

The system is based on inaudible computer signals. These inaudible signals will contain a list of the broadcast frequencies for various stations and a device within the radio will decode the information and assure that the radio remains tuned to the strongest signal for the station. The BBC will begin transmitting the data signal in the autumn of 1987. Unfortunately, no manufacturer has yet expressed interest in making the radios capable of using the BBC's service. Of course, the greatest adaptation of the circuitry would be in the area of shortwave, which was not mentioned in the article. Tom McKeon, Indianapolis, IN.

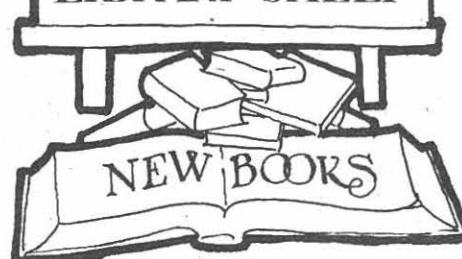
From Russia with Love: The Selena 215

A Belgian shortwave firm called Radio Mail is now marketing the Soviet shortwave receiver, Selena 215. The radio, which operates on either 9 volts worth of batteries or from 220-240 AC, offers an exotic range of frequencies including long wave (148 - 285 kHz), AM (525 - 1607 kHz), FM (65.8 - 74.0 and 87.5 to 108.0 MHz) plus six shortwave bands including 1.6 - 4.0, 5.95 - 7.30, 9.50 - 9.77, 11.7 - 12.1, 15.10 - 15.45 and 17.7 - 17.9 MHz. Also included is a field strength indicator, telescopic rotatable antenna for FM and SW, as well as connections for an external antenna, ground, tape recorder and earphones. It's an exotic piece of equipment for the international radio listener. The Selena 215 is available for US\$199.00 from Radio Mail, B.P. 93, 1060 Brussels 31, Belgium.



Looking for an inexpensive crystal portable? The PRO-26 can mix low, high and UHF in its four channels.

LIBRARY SHELF



FREQUENCY CONTROL FOR THE R70 USING A C-64 MICROCOMPUTER by David L. Oliver (Disk and documentation \$16.75; interface cable \$20. From David L. Oliver W9ODK, Dept. MT, Route 2, Box 246, Shevlin, MN 56676)

Although the ICOM R70 receiver has been superseded by the R71A, there are still plenty of the former models around, and they are excellent performers. Their flexibility may be enhanced even further by the addition of computer control.

Dave Oliver has done a good job in developing a disk-controlled program for the R70 (it will also work with the IC-720A transceiver), utilizing the user port on the rear of the receiver. At the present time Dave is not working on an R71A version.

In operation the program allows up to 64 memorized frequencies and modes to be entered; no interface device is required aside from the cable which is interconnected between the computer and receiver ports.

The program contains a list of frequency allocations for the major amateur radio bands, listings of frequencies and times of English language international broadcasters, and large amounts of additional space for user-added information. Front panel controls on the R70 may still be accessed manually if desired while the program is in operation.

A main menu is your guide to the program; the Commodore's function keys provide operational changes in the receiver. Printed documentation for the program is well written and easy to understand.

HOW TO BE A HAM by W. Edmund Hood (310 pages, 5"x8", paperbound; #2653, \$12.95 from TAB Books, Dept. MT, Blue Ridge Summit, PA 17214)

If you are serious about getting into ham radio, Hood's new update (1986) probably has the answers to just about every question that might come to mind. Starting with a little history of ham radio and some insights into hams' themselves, Hood's book evolves into station descriptions and FCC test material.

Amateur radio practices and specialties are introduced (license classes, MARS, repeaters, message handling, rules of the road, etc.), followed by good basic theory on transmitters, antennas, receivers, radio wave propagation, modes of emission, interference, and mobile operation.

Over 60 pages are devoted to typical questions from the FCC amateur radio exams, and Part 97 of the FCC Rules and Regulations (amateur radio) is reprinted in full, including the new provisions for the volunteer examiner program.

HOW TO BE A HAM is a handy handful, both for the aspiring ham and the teacher of amateur radio.

GUIDE TO EMBASSY AND ESPIONAGE COMMUNICATIONS by Tom Kneitel (8-1/2" x 11", 96 pages, paperbound; \$10.95 plus \$1.50 postage and handling from CRB Research, P.O. Box 56 Dept. MT, Commack, NY 11725)

Entertaining and informative with titillating anecdotes highlighting various espionage activities which made the news--and some that didn't.

Tom's reading style is easy to follow and his unusual sources for inside information have always been provocative. The **GUIDE** is no exception.

Following the speculative text is an expansive directory of diplomatic communications networks, alphabetized by country or agency. Frequencies, call signs and operational modes are included.

The **GUIDE** concludes with a short section on "spy number" stations along with a list of recently-reported frequencies on which these tantalizing transmissions have been heard.

MILITARY RADIO SYSTEMS (California Edition) by Robert Kelly (8-1/2" x 11", 80 pages, unbound; \$8 from Mobile Radio Resources, 2661 Carol Drive, San Jose, CA 95125)

Whether you live in California or not, the data in Bob's new military radio guide will prove invaluable to utilities monitors with scanners.

Since many frequencies used by government and military agencies are common across the country, the listings in this packet may prove invaluable for identifying military transmissions encountered in areas outside of California as well as within.

NASA fans will find considerable useful information in its pages

with Edwards and Vandenberg Air Force Bases thoroughly represented. A list of VHF high and low as well as UHF frequencies allocated to the military is provided in the back section with callouts of major users.

SCANNER RADIO LISTINGS: Los Angeles Area by Norm Schrein (8-1/2" x 11", 396 pages, paperbound; \$14.95 plus \$1.95 shipping from Fox Marketing, 4518 Taylorsville Rd., Dept. MT, Dayton, OH 45424)

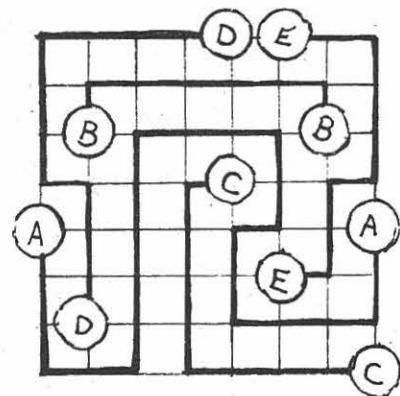
This husky and information-packed edition is bound to make considerable impact on the scanner-

oriented west coast listeners. **MT's** scanner columnist Norm Schrein has put together an excellent collection of public safety, business, news, railroad, industrial, aircraft, amateur, satellite, federal government, weather broadcasting, forestry service, and many other categories for monitoring.

Arranged alphabetically, the directory is cross-referenced by service, call sign and frequency. A comprehensive list of cellular licensees and frequencies is included.

The book covers major suburbs and counties surrounding Los Angeles.

(Solution to **CROSSED WIRES** from page 42)



ICOM R71A (HP)



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Watch for ICOM full page Ads for more details. EEB engineers are developing options for the enhancement of the R7000 performance-computer control video output, filter options and more. Call or Write for details.

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SONY ICF-2010/ICF-2001D

RDI Ratings of Overall Performance: ***

The top choice for portable use. The pick of the litter.

by Larry Magne

What we have on the bench today is Sony's remarkable ICF-2010 portable, known outside North America as the ICF-2001D. It's been on Sony's drawing board for at least three years now and represents a qualitative advance over conventional radios. Why? It's the first widely-distributed receiver to operate in the synchronous exalted-carrier selectable-sideband mode (ECSS-s). What this mouthful means is that the '2010 is able to reduce interference and distortion far more effectively than can a conventional shortwave radio, and its operation is simple and foolproof.

At First Glance...

First, let's take a peek at the set itself. It's midsize, yet small enough for air travel. It covers the entire shortwave spectrum, plus longwave, mediumwave AM, FM, and the VHF aeronautical band. Outside North America and Japan the actual coverage sometimes is reduced, as in certain countries it's illegal for radios to be able to pick up such things as aeronautical or police transmissions.

The '2010 has a scanner, on/off and sleep timing facilities, 32 programmable channel memories, a novel signal strength indicator... plus keypad tuning. More important, it has a real tuning knob. The use of "up and down" frequency slewing pushbuttons in lieu of a tuning knob with the predecessor model '2001 seems not to have been as popular as Sony originally thought. The '2010 has, thankfully, dispensed with these buttons and gone back to a conventional tuning knob which, in this case, changes frequency in increments of either 100 Hz or 1 kHz. There is, however, a soft "thoop" sound and split-second muting which accompanies each incremental frequency change.

The liquid crystal display offers unusually precise frequency readout for a portable -- to the nearest 100

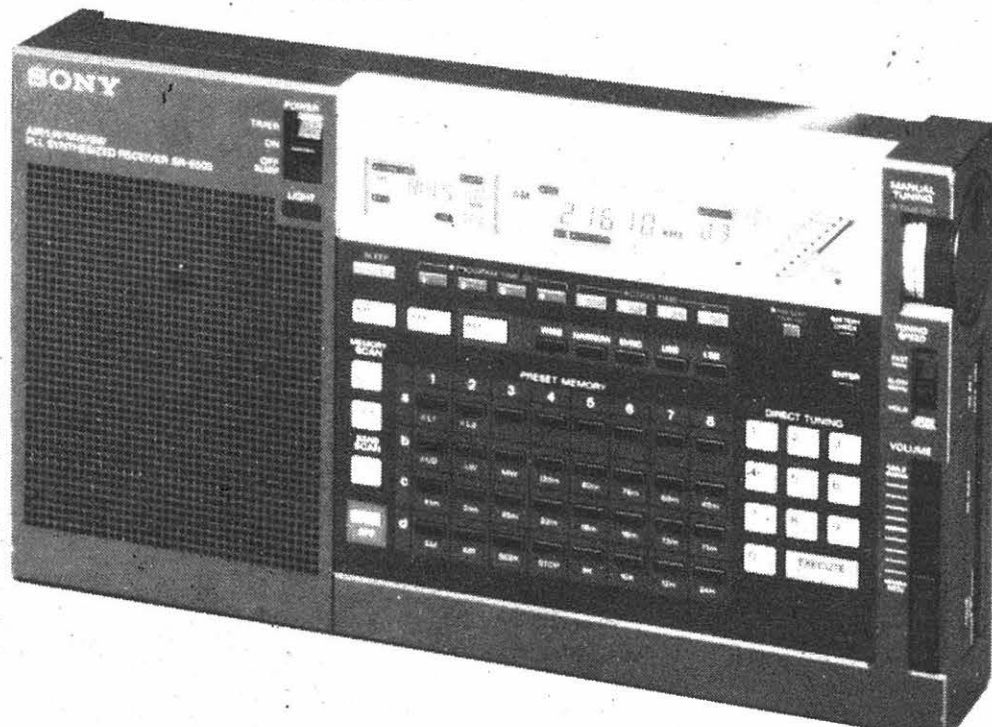
Hz, no less. The display also includes various other operating data and a 24/12 hour digital clock, which seconds as a timed on/off switch.

But, of course, it's the '2010's AM detection circuitry that puts it generations ahead of the pack. There's no abracadabra -- you simply tune the '2010 as you would any other radio. If the station you want to hear is disturbed by interference from another station nearby, twist the tuning knob one click and the interference drops down or vanishes. The difference in how this sounds when I go back and forth one click with the tuning knob can be considerable. Of course, if the station you're trying to hear is boxed in with heavy interference on both sides or on the same channel, not even the '2010 is going to do much good.

In reality, tuning ECSS-s on the '2010 is remarkably straightforward once you know how. If the station you wish to hear is interfered with by another station nearby, with the "sync" switched on and the bandwidth on "narrow", turn the tuning knob one click (100 Hz) and the interference often is reduced or eliminated. For example, if you were listening to the BBC World Service on 5975.0 kHz, you would hear the BBC's upper sideband. But if you were tuned to 5974.9 kHz, you'd hear the BBC's lower sideband instead. If there were a strong station on 5980, but nothing comparable on 5970, you would naturally choose the lower sideband, as that is the one exposed to less interference.

Unfortunately, the ICF-2010 owner's manual treats the whole subject of ECSS-s reception too briefly and in arcane language which inadequately explains this major plus offered by Sony's innovative receiver. As a result, we've received numerous requests asking for an explanation as to how to tune the '2010 properly.

Another problem is that the ECSS-s circuitry has suffered from sample-to-sample variations in factory alignment. If the set is working properly, the listener should be able to switch between LSB and USB in the ECSS-s "sync" mode by changing the setting of the tuning knob by no more than 100 Hz when it's exactly on frequency. Misaligned samples require considerable de-tuning. For example, the BBC on 5975 kHz should switch between LSB and USB somewhere in the 5974.9 - 5975.1 kHz range. However, a misaligned sample may make the switchover



some distance away; say, 5975.4 kHz. Fortunately, the Sony Service Manual gives instructions that allow a trained technician to remedy the problem.

A Good Value

In other respects, the '2010 generally performs well. Skirt selectivity is nearly equal to that of a costly communications receiver. In fact, laboratory measurements of radio performance factors show that one of the '2010's strong points is selectivity -- sorting the wanted signal from nearby interference -- using the innovative ECSS-s circuitry and a choice of two high-quality, but wide (9.4 and 4.3 kHz), bandwidth filters. It performs well for a portable in its price category, but it should not be mistaken for a serious communications receiver. Sony's choice of a "wide" filter -- 9 1/2 kHz -- can result in adjacent-channel heterodyne howls even on the mediumwave band. In the far-more-crowded shortwave bands, where channel spacing is roughly half that of the AM band, this "wide" filter lets in all manner of interference. At times, even the "narrow" filter is too wide. A good 6 or 7 kHz bandwidth, paired with one of 3-3.5 kHz, would have been preferable. With ECSS-s and conventional AM reception alike, this would have resulted in reduced interference, yet provided for audio bandwidth appropriate to the '2010's aural capability.

The '2010 -- except for the aeronautical band -- is sensitive enough, but internal circuit noise ("hiss") with early samples was audibly higher than it should have been, particularly when the ECSS-s "sync" circuit was switched in. This noise, along with the excessively wide bandwidths, detracted noticeably from the considerable audio-fidelity - and DX -- potential of this receiver.

Fortunately, the audibility of this noise has been reduced with recent 1986 production samples, thanks to alteration of the frequency response pattern within the audio stage.

The audio quality is a bit above average for a compact.

We've already noted how ECSS-s circuitry can improve the sound quality of shortwave broadcasts. Suburban mediumwave (so-called "AM band") listeners also will find it has the potential to improve reception of fringe mediumwave signals in the evening, when reception can be a mixture of darkness-hours skywave propagation plus the usual around-the-clock groundwave. Because skywave (reflected from the ionosphere) takes a split-second longer to reach the receiver, there is "selective fading" analogous to "ghosts" on TV. Selective fading, during those moments when it attenuates the transmitted carrier more than it does the sidebands, produces distorted audio...sometimes so severe that you can't understand the programming. But ECSS-s reception relies on a steady carrier synthesized within the receiver, eliminating this problem.

Certain portions of this state-of-the-art circuitry form the basis for very good reception of shortwave single-sideband (SSB) and independent-sideband (ISB) signals, as well. Hams and "utility" DXers will find the '2010 to be one of the best portables available to eavesdrop on transmissions in these modes.

The '2010 also serves well those who listen to the program feeders of the American Forces Radio-TV Service, Voice of America, Deutsche Welle, and other radio organizations which regularly beam SSB/ISB transmissions to overseas relay stations for rebroadcast (other program feeders, such as those from Argentina, Paraguay and Cuba, are used on an as-needed basis for sports and other special events). These feeders, being point-to-point transmissions, operate outside bands allocated to shortwave broadcasting and thus tend to be relatively free from interference. Another bonus is that SSB and ISB program feeders, such as those of Radio Free Europe/Radio Liberty, are almost never "jammed", as are

RDI Scale of Overall SWL/DX Performance

- ***** Superb
- **** Excellent
- *** Very Good
- ** Good
- * Fairly good

No stars = Fair (F), Poor (P), or Unacceptable (U)

their usual broadcasting channels. RADIO DATABASE INTERNATIONAL thus includes these feeders among its listings.

Somewhat surprisingly, the '2010, which uses a stereo AM "chip" as the basis of its ECSS-s circuit, does not provide AM or FM stereo reception via earphones as does, say, Sony's popular Walkman or Sharp's discontinued FV-610GB. As to FM monaural reception, the '2010 shows a marked propensity to overload (a solution for those living near very powerful FM stations is to collapse the telescoping antenna). In some locations FM signals also penetrate into the '2010's shortwave circuitry, causing distorted interference to shortwave signals.

The 24/12 hour clock's display is separate from the digital frequency readout. Its timing features include the ability to turn on the receiver automatically up to four times a day in order to catch favorite broadcasts, then turn it off again 15, 30 or 60 minutes later. A sleep switch can be set to turn off the set automatically up to an hour later. So thoroughly is this thought out that you can go to sleep listening to one station, yet be awakened to another station of your choice.

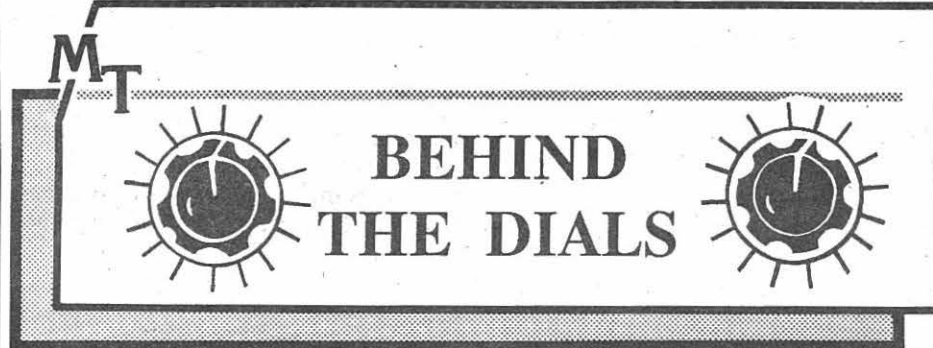
The Sony receiver has a scanner which sweeps frequency ranges or the memory channels in two ways: by stopping on the next "active" frequency, or by pausing just long enough -- 1.5 seconds -- for you to determine whether a station is operating, then continuing the scan. The scanner probably will be practical value only for those who prowl the '2010's VHF aeronautical band. Most compact portables have no dial light whatsoever for nighttime use, and a woefully inadequate "glow light" to indicate signal strength. The '2010, however, indicates strength of reception with a nice set of 10 small LEDs, which second as battery strength indicators.

And the receiver has a tiny light controlled by a 15-second time-delay switch, which shuts itself off automatically to preserve battery life.

While the '2010's battery consumption is above average for a compact portable, it is not out of line for a set with a worthy audio stage. To prevent accidentally turning on the receiver while traveling, a flush on-off toggle switch plus a separate main power switch are provided to give double protection.

Innovative and Affordable

The set's 76 controls, switches, buttons and knobs may seem forbidding to some newcomers, and thus may limit the set's popular appeal. But everything is logically arranged. Anyone who can use a sophisticated pocket calculator soon



RADIO SHACK PRO-32 SCANNER

By far the best hand-held programmable that Radio Shack has yet released -- that would be a fitting description of this feature-packed new scanner from Tandy.

200 (plus ten temporary) memory channels may be scanned sequentially or in ten banks of twenty each--any combination. A bright edgelight permits the large liquid crystal display to be easily read at night.

Scan and search speed of eight per second may be slowed to four; the entire 200 channels are swept at fast speed in approximately 25 seconds. A 300 milliwatt audio output rating makes this one of the loudest--and least distorted--hand-held scanners we have ever tested.

A professional belt clip is provided and top mounted pushbuttons permit the wearer to select scan, speed or manual as well as adjust volume and squelch. A BNC antenna

connector permits replacement of the rubber duckie whip provided.

A quick look at additional functions reveals search, individual channel lockout, individual channel delay, channel one priority, entry clear, keyboard lock, and ten temporary search/store memory channels which may be transferred into permanent memory.

The LCD readout indicates an array of status functions including frequency readout (to four decimal places), operation mode, channel number, delay status, lockout status, error message, low battery indicator, and memory bank indicator.

Frequency ranges of the PRO-32 are 30-54 (low band), 108-136 (aircraft), 138-174 (high band), and 380-512 MHz (UHF). Each keyboard entry is accompanied by a soft "beep" showing that the command was registered; an erroneous entry is signalled by a succession of several beeps as well as the visual "ERROR" message.

Power is provided by six AA cells (not provided); and three additional silver oxide cells (not provided) are required for the memory. Two side-mounted sockets allow use of an external charger when NICAD

should be comfortable operating the '2010.

In some of our reviews we've referred to how important chips could be in reducing the cost and size of high-tech shortwave equipment. The '2010 is an excellent example of that. Its innovative circuitry is on a stereo AM chip Sony had already developed for other purposes. The original receivers with this sort of circuitry were for intelligence and related applications and cost thousands of dollars. Now, anybody can have one for under \$400.

Some years from now, all shortwave -- and probably mediumwave -- radios will have advanced detection/interference-rejection circuitry such as is found on this innovative model. It's the obvious receiver of choice if you are seeking a portable to provide aurally-superior shortwave and mediumwave reception.

The Sony ICF-2010 fills an important gap between the low-cost portable that most people buy for their first shortwave radio, and the exotic receivers that are only of interest to radio enthusiasts. This receiver from Sony really does make shortwave listening more pleasurable, and by the time discounts are factored into its current \$369.95 list price, it will be awfully affordable, too.



The PRO-32 scanner--the best yet from Radio Shack

batteries are used, or for an AC or mobile power adaptor.

An earphone jack (but no earphone) is provided for private listening.

Scan/search increments are in 5 kHz steps for 30-54 and 138-174 MHz, 2 kHz for 108-136 MHz, and 12.5 kHz for 380-512 MHz. Sensitivity is 1 microvolts on aircraft band, microvolt or better on all other bands. IF selectivity (±9 and 15 kHz) is -6 and -50 dB. IF rejection is 50 dB. Priority sampling and delay are two seconds.

The dual conversion receiver utilizes 10.7 MHz and 455 kHz IF with one crystal and one ceramic filter modulation acceptance is ±5 kHz.

The PRO-32 measures 7-3/8"H x 2 15/16"W x 1-3/4"D and weighs 1.1 pounds with batteries installed. Priced at \$299.95 in the 1987 catalog

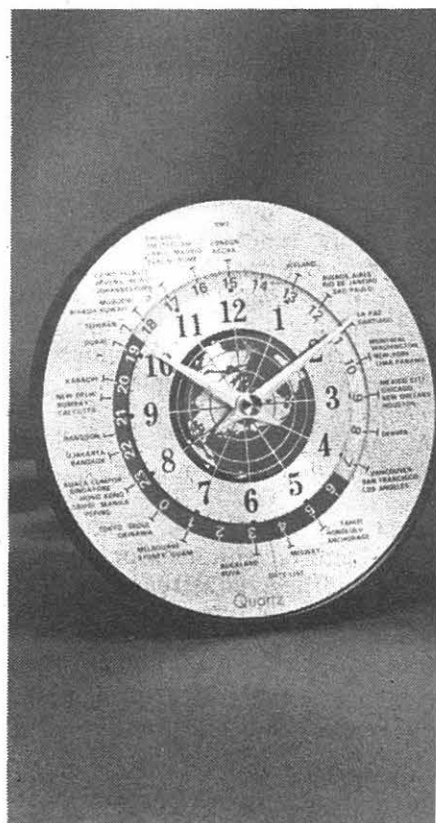
World Time Clock

A handsome, desk-top, dual zone, world time clock with silent quartz movement and accuracy of one-half second per day makes a handsome addition to any listener's monitoring console or ham's operating position.

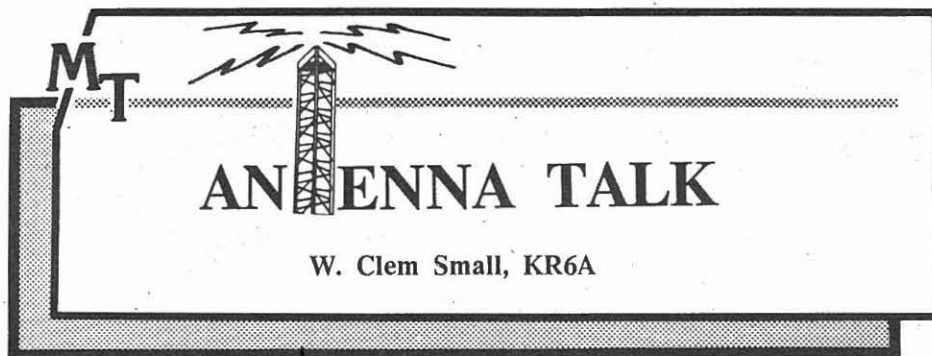
The basic model sells for \$32.95 to MT subscribers (regular \$44.95) and is equipped with mounting pedestal--nothing else needed but one inexpensive AA cell for a year's operation.

Local and 24 hour time are displayed simultaneously on the attractive 6-1/2" gold-accented face, with time zones in key cities around the globe also displayed.

Available from World Tech Products, Inc., 1233 Kapp Drive, Clearwater, FL 33575. Phone orders are taken at any time by calling 1-800-835-2246. Don't forget to mention that you saw the ad in *Monitoring Times* to get your discount!



World Tech 24-hr clock



ANTENNA TALK

W. Clem Small, KR6A

MAKING A GOOD ANTENNA BETTER

When we ponder the function of the antenna in our communication system, we realize that it is, quite literally, our interface with the rest of the communications world. The importance of an adequate antenna for your communications system cannot be overemphasized.

Our requirements may be well satisfied by a mediocre antenna system if our interests are limited to such non-demanding activities as monitoring local (and therefore strong) utility signals, or casually tuning the shortwave bands. But when we want to pick up distant weak signals or transmit to far-away QTHs, then antenna performance becomes an important factor in the overall performance of our system.

Antennas Can be Tuned!

Most of the antennas in use today are of the type that are designed to be resonant at the frequency or band of operation. For example, antennas such as the half-wave dipole, groundplane, Yagi-Uda, colinear, inverted-vee, and most other antennas you can think of are of the resonant type.

Non-resonant antenna types are much fewer in number and include the Beverage, rhombic and non-resonant vee (don't confuse this with the inverted vee). Since the non-resonant antennas tend to be very large, expensive and difficult to erect, most people reading this column are probably using some type of resonant antenna system.

If the antenna is resonant, it essentially functions like a tuned circuit at the frequency or band for which it is designed. When your rig, line and antenna are matched, this resonance tends to produce the maximum signal output to your receiver and also provides the antenna's "textbook" radiation pattern when transmitting.

Most of us use commercially manufactured antennas or antennas which we have constructed at home from instructions in a "how-to-do-it" publication. These antennas were designed for some theoretically "average" site, or perhaps for theoretically ideal conditions.

Since our station site will depart to some degree from either average or ideal conditions, the antenna will not be optimally matched to our specific site in the vast majority of cases. Not only will it probably not have quite the resonant frequency for which it

was designed, its radiation pattern will likely not be as anticipated, it will likely not have the impedance its design specifies and will not, therefore, match the impedance of the coaxial cable which we use.

J.D. Wells has stated this problem as follows: "Most of the ... patterns you see in the handbooks are for an antenna remote from earth. And when they say remote, they mean RE-mote! The ground has considerable effect on ham antennas below 30 megacycles because we don't get five or six wavelengths from ground.

"What this means is that, the directivity pattern is not ideal, the impedance at the center is probably not 72 ohms, and the angle of radiation is most likely not what we would like it to be. Also you don't have a perfectly conducting ground under it and you may get combinations of effects that would defy description." (1) Well said, Mr. Wells.

So What?...

...you may ask at this point. Am I trying to prove that most of us have less than optimal antenna systems? Well, in a way, yes. Although the average antenna is probably functioning "adequately," most of us can improve the operation of our communication systems considerably if we take the trouble to tailor the antennas which we use to the site where they are erected.

If we decide that we want to do this, the question arises as to just how to accomplish the feat. Let's survey some of the approaches and equipment types that are used for this purpose.

Common Antenna Test Gear

The most common instruments used in adapting antennas to a specific site include: the noise bridge, the dip meter, the antenna impedance meter, the field strength meter (FSM), and the standing-wave ratio meter (SWR meter).

The first three of these instruments do not require a transmitter at the station under test; The last two instruments are generally used at sites which employ a transmitter because they are designed to assess a signal after it leaves the antenna (the FSM) or as it is fed to the antenna system (SWR METER).

The Noise Bridge

The noise bridge is a means of

generating noise across a wide band of radio frequencies, and then detecting the response of your antenna to these frequencies. With this instrument you can determine your antenna's resonant frequency and impedance; as well as make some useful transmission line measurements.



Figure 1. An antenna noise bridge.

The Dip Meter

The dip meter, the modern version of the tube-type grid-dip oscillator, is a resonance-indicating device. It consists of a small portable oscillator which is affected by nearby resonant circuits.

The effect is such that a change (dip) in current in the oscillator is caused when the oscillator is tuned to the resonant frequency of the nearby circuit. By coupling the oscillator to your antenna, you can determine the antenna's resonant frequency.

The Antenna Impedance Meter

An antenna impedance meter, sometimes called an "antenna bridge," "antennascope" or "Z-scope," allows you to determine the feedpoint impedance of your antenna. By shortening or lengthening the antenna, you can bring the impedance to the proper value to match the feedline, allowing maximum power transfer.

Use of an antenna impedance meter requires a source of radio frequency signal; usually, this signal is furnished by a dip-oscillator, but other low-power oscillators may be employed.

Field Strength Meter

The field strength meter is essentially a simple receiver which presents its output visually via a meter movement

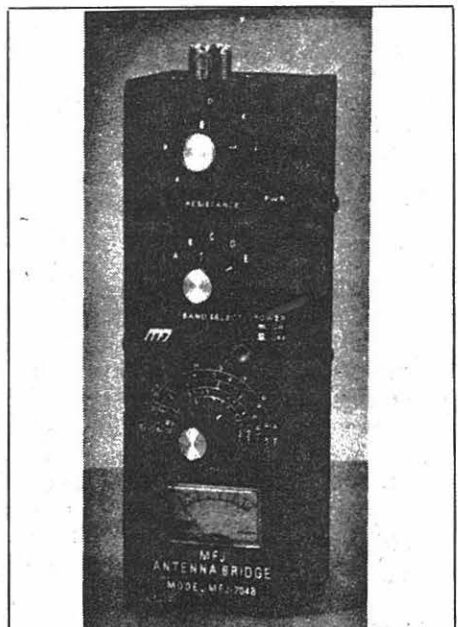


Figure 2. An antenna impedance meter.

which increases as the antenna's output increases. Some models give an audible output as an added convenience and also for use by blind operators.

During antenna adjustments, field strength meters can be used to indicate relative signal output strength. Some models are tunable and may be used to check for the presence of specific harmonic frequencies with the antenna may be radiating.

The Standing-Wave-Ratio Meter

The SWR meter is probably the best known, and perhaps most misused, of the popular antenna test instruments. An SWR higher than one indicates that some power is being reflected from the load on the transmission line (the antenna in this case) back to the source (the transmitter). This sounds bad to us and we generally get the idea that the SWR should be as close to 1/1 as possible.

Theoretically, that's true, but we have it on good authority that ratios as high as 10/1 are not unacceptable on HF when we have low feedline losses. Values of 2/1 or even 4/1 are generally not cause for much concern as far as antenna system efficiency goes, but some solid-state rigs can't tolerate such SWR levels. Everyone should read discussions such as those by Bill Orr (2) or John Haerle (3) on the relative contribution of SWR level to signal output.

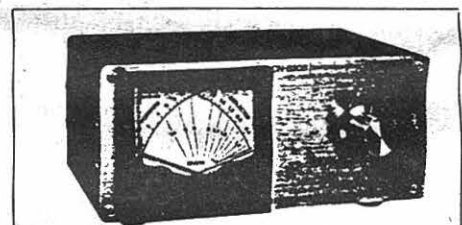


Figure 3. An SWR meter.

In an SWR meter is inserted in the transmission line between the transmitter and the antenna tuner, the tuner can then be used to adjust the SWR of the antenna system for more efficient operation. This won't correct for mismatches at the antenna and of the transmission line, but if your transmission line is relatively low-loss, your system is likely to perform well anyhow.

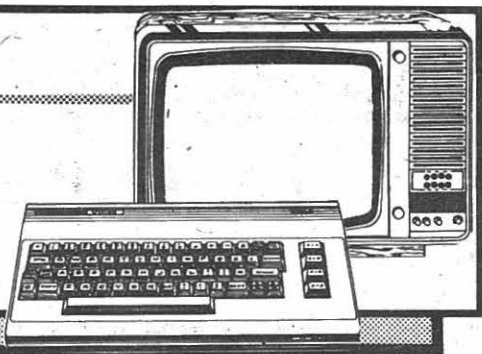
Summary:

It is not the intention of this column to make you suspicious of, or unhappy with, your present antenna system; it's probably doing a fine job. Just as we don't need finely-tuned race cars to get us around town, we don't all need to fine-tune our antennas.

But some of us are concerned at times with getting the best performance possible from our antenna systems. When the going is tough and we want to read those tantalizing weak signals, an optimized antenna system can make the difference.

Computer Corner

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Micros for Communications

At the heart of every personal computer is a rather large and complex integrated circuit called a microprocessor. Simply called a "micro" in most circles, this device does 90% of the computer's work. It, coupled with all the surrounding memory, disk drives, etc., form the "machine" called the personal computer.

But this micro is not just a computer chip; it is found in some very strange company at times. Lift the cover of the new TEKTRONIX 2236 oscilloscope and you find one buried in with all that analog stuff; pop the cover on your home sewing machine and, if it's one of those fancy do-all machines where you merely push buttons to get all the fancy stitches, there is a micro in there somewhere as well.

Look under the hood of most newer automobiles today, and you'll find one there, too. With all this happening around us, it is inevitable that the micro find its way into the communications gear that we all own--or would like to own.

So, let's take a look at what a micro is capable of and how we might put one in a home brew piece of gear. Naturally I can't give you all there is

to know about micros in this column, or even one book. But I can give you a basic understanding, and point you to where you can look for more information.

In this month's column I will try to trace the evolution of the micro, and cover some of the basic characteristics and next month, perhaps, cover the support chips that might be used with the micro. Space permitting, we might even discuss some general applications in communications.

Evolution of the Micro

Years ago, anyone wanting to build a computer for whatever task gathered a mountain of transistors, diodes, resistors, capacitors, and so on, and set about to build every operation the computer was to perform in discrete hardware.

The result was a machine the size of a large room, with less capability than a small desktop personal computer. Each shift register, each storage latch, ad infinitum, had to be built with discrete components and matched to the next stage.

In an effort to shrink this mess in size, various companies started to

build several transistors on one silicon chip. More and more transistors, diodes, and even resistors and capacitors were successfully incorporated on the chip.

In the late '60s Texas Instruments introduced a line of advanced chips which they called the 7400 series. Unique to these chips was a standardization of package size, voltage pins, characteristics for interconnection, and a fairly high speed of operation.

This standardization led to the development of more and more functions on a single chip; now it became possible to connect chips from different manufacturers without a lot of matching, amplifying and so forth.

The TTL (Transistor-Transistor Logic) family, as it became known, was and is one of the most popular logic families to date. The packaging, the levels and supply voltages, and ease of use have affected most of the logic developed to date.

The concept of the micro is credited to various individuals and companies, but the general consensus is that INTEL developed and marketed the first successful micro, the 4004. Following the 4004 was the 8008, the first eight bit chip. Then a faster more complex chip was released, the 8080.

Shortly after the 8080, another company got into the swing, and the ZILOG Z80 was released, very similar to the 8080. If we take the INTEL line, however, as indicative of the industry growth, we can see in the part numbers the rapid growth of the capability of each successive design.

Following the 8080 came the 8088 which IBM chose for their PC. Next came the 8086, (full 16 bit operation), then the 80186, 80286 and the 80386. IBM chose the 80286 for its PC/AT. There is a virtual certainty INTEL will release at 80486, and it will probably be a full 32 bit micro.

This is not to say other companies were sitting still. Motorola developed the 6800, the 68000, the 68020, and so on. NEC developed the V series, pin-for-pin replacement for most of the INTEL devices with improved performance. A designer could replace the 8088 in his design with NEC V-20 and pick up on a 10 to 2 percent increase in performance.

How Does it Work?

So, basically, what does this magical chip do? In essence, it is merely a robot device that responds to a given digital input with a known logic operation. This is the basis of operation for all micros.

The digital inputs are known as instructions, and no two micros have identical instruction sets. This is the reason a program written for a Commodore machine will not run on an Apple, or vice-versa.

To build our micro-controlled device, we select the micro to build around based on the task we are trying to accomplish. For example, a 8088 would be a good choice for a small general purpose computer, but an 8048 would be a better choice for the sewing machine controller. INTEL has a series of micros which are optimized for control purposes such as the 8048, 8051, and the 809

Once we have a micro selected, we have to make provisions for instructions to be passed to it, one at a time. The easiest way to do this is to put the series of instructions in ROM (Read Only Memory) chip and, starting with the first ROM address, step through the ROM contents, allowing the micro to act on each instruction from the ROM.

In this manner the micro receives instructions and acts on each one. There are address lines coming from the micro, and the micro itself addresses one to the address count each time it completes an instruction.

Built into the micro is a circuit that forces the address to 0000 when the power is applied. This insures that the micro is starting from a known instruction. There is only one other operation that is required from the micro for addressing - that of doing a branch or jump instruction.

To do one of these instructions, the micro figures out from the instruction where the new address is and changes the address output line to the ROM to select the new address to use. The micro contains all the circuitry to decide to change the address output to a whole new

(Antenna Talk, cont'd)

Specifics on how to use the test instruments described above are included in their instruction manuals, and to one degree or another in references 2 through 7 below. If you have particular questions about antenna tests and measurement, drop me a line. If enough readers show an interest on a particular topic, I'll try and cover it in a future column.

RADIO RIDDLES

Last Month's Radio Riddle: There were two parts to last month's radio riddle: (1) From what does the name "dipole" derive? And (2); At times you may see the half-wave dipole referred to as a "doublet" antenna. Is this correct?

For the first, "dipole" is, obviously, built from "di" and "pole." The "di" comes from the Greek "dis," meaning "twice," while "pole" comes from the Greek "polos," a pivot, or a pole like a long slender stick. In electrical usage the term "pole" has come to mean either of the two oppositely charged terminals of an

electrical source, such as a battery or generator.

The voltage distribution on a dipole antenna is such that its ends are oppositely charged. This source of electromagnetic waves, with its two poles, is quite appropriately called a "dipole."

And in answer to last month's second radio riddle, the 1984 Institute of Electrical and Electronic Engineers Dictionary of Electrical and Electronic Terms, when defining the dipole antenna, gives "doublet" as a synonym for "dipole"; In the two terms "dipole antenna" and "doublet antenna" have the same meaning.

This Month's Radio Riddle: When using a field strength meter we are often advised to move the meter a few wavelengths away from the antenna to get our most accurate reading. Why? The answer has to do with the presence of two different fields near the antenna, and the two fields in question are not the electrical and magnetic fields.

Answer next month. 'Til then, 73.

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value instead of adding one to the previous address.

A Use for the Micro

Let's say we have an instruction sequence that allows us to read a front panel of a piece of equipment. The micro has pins called ports that connect to the outside world and allow us to do things such as read switch positions on a panel.

This and other similar operations are done by wiring each switch to one pin (or port bit). An instruction to gate the port inputs into the micro will cause the micro to obtain the status of the switches, either one or off, as the case may be.

Once this status or bit pattern is in the micro, another instruction asks the micro to compare the bit pattern with the pattern obtained on a previous read. If one or more bits are different, then someone changed the switches since the last time the switches were read, and the micro can decide, based on further instructions, what action to take next.

Thus we have a way for a micro to find out what we are doing with front panel controls as we change them. Naturally, all this doesn't happen as we operate the controls, but it happens fast enough that we don't realize that it isn't instantaneous.

This method of reading the switches is called "polling" the switches, and is the easiest way to use the micro to read information from the outside world.

In actuality, the micro can poll the switches every 50 milliseconds to detect any change in their settings, and still do many things between polls. Since a typical micro can execute instructions about once every microsecond, a lot of instructions are done between polls.

The person using the switches will never know if he pushed the switch a few milliseconds before the micro polled, or up to 50 milliseconds before; most people can't push and release a pushbutton in less than 200 milliseconds!

The port we just used to read the switches is called an input port; it has a counterpart called an output port which is used for control functions like turning things on and off, setting values in, for example, a phase locked loop register, and so on.

Until Next Month

Next month we will cover the support chips that we might need to finish our control system. In the meantime, try to get your hands on any of the INTEL or MOTOROLA microprocessor manuals and browse through them. Don't get bogged down in details; just try to get a feel for the overall operation and try to relate some of it to what we covered here.

Bulletin Board System Update

Computer hobbyists frequently write us asking if there are computer bulletin board systems near them for various aspects of the listening hobby. This month we are pleased to present the first in a series of BBS terminals which will grow as you, our readers, contribute additions.

The list printed herewith was contributed by Mike Edelson, an official emergency and relay (amateur) station and net manager of the Tri-county Emergency and Traffic Net, who lives in Roselle Park, New Jersey.

Public Access Computer Systems

All times given are in Eastern Standard Time, the letter "X" followed by a number implies "Except" the number of the day of the week [1=Monday, 2=Tuesday, 3=Wednesday, 4=Thursday, 5=Friday, 6=Saturday; 24HRS67=24 hours on the weekends], *24=on line 24 hours a day.

REMOTE NORTHSTAR NASA (Greenbelt, MD)	(301) 344 9156
CBBS AMRAD (Washington, DC) *24	(703) 734 1387
THE BULLETIN BOARD(W4WYP) (AL) 2000-0700 X24	(205) 758 5017
NN4Y BBS (AL)	(205) 649 2894
RBBS (K6IYK) (So.CA)	(818) 998 0319
WESTLINK REPORT BBS (So.CA)	(805) 251 5558
COMPUTER MESSAGE CTR (KB4EUX) (Carrollton,GA)	(404) 834 9097
SUNSHINE BBS (AI9D) (IA)	(319) 557 9659
A*C*E* BBS (KS)	(913) 677 1288
MASSHAM BBS (Boston,MA) 1800-0800 M-F/24HRS67	(617) 923 7605
FENTON TBBS (Fenton, MI)	(313) 629 2854
FLINT-AREA BBS (KA8O9CN) Flint, MI)	(313) 238 4984
AMATEUR RADIO COMMODORE CLUB COMPUTER	
NEWSLETTER (WA0COG) (MN)	(612) 431 1140
DIGITAL NEWSLETTER BBS (K0TG) (MN)	(612) 291 0567
MICROFONE BBS (NJ)	(201) 494 3649
TIMEX SINCLAIR AMATEUR RADIO USERS GROUP	
(FIDO NETWORK) (Las Cruces, NM)	(505) 646 5194
BALD HILL TECH GROUP (W2JUP) (Long Is, NY)	(516) 736 2208
NO FRILLS BBS (Southshore ARC & TIUG) (Long Is,NY)	(516) 661 3643
PACKET BBS OF NYC (New York, NY)	(212) 250 7090
LAMAR UNIVERSITY BBS (WB5VNX) (TX)	(409) 838 3761
HAMNET BBS (Seattle, WA)	(206) 285 3040
MILWAUKEE COUNTY AREA BBS (WB9YSG) (WI)	(414) 543 0988

MT

TECHNICAL TOPICS

Bob Grove

Q. Is the ICOM R700 really worth all the extra money for the serious listener? (Terrence Smith, Saint Joseph, MI)

A. The R7000 is a truly well-engineered and fine-performing receiver, certainly the best VHF/UHF receiver ever designed for the consumer market. It is certainly a quantum leap above what is in second place. As to whether it is worth \$1000, only you can answer that.

Q. Who makes an add-on frequency display for receivers? (Samuel Stoneking, Holton, IN)

A. At this writing, only Torres-tronics of Dayton, Ohio, lists such an add-on device.

Q. Is there any way to reduce receiver interference from fluorescent lights? (Winston Ito, Hayward, CO)

A. Unfortunately, most electrical noise heard on shortwave receivers is picked up by the antenna system, radiated into space by the offending device. A simple fix which I use on my own fluorescent fixtures involves disconnecting them from the AC line, soldering 0.1 mF @ 400 or 600 Volt capacitors from each side of the AC wire to a common ground point, and attaching a ground wire to that point.

A chapter on electrical interference may be found in Grove's Listener's Handbook, available for \$12.95 plus \$1.50 shipping from Grove Enterprises and Grove dealers nationwide.

Q. Say the worst happened and we had to turn in our scanners, and say some of us don't. Can the FCC driving by a house 50' from the road pick up any RF or any other signal from a scanner? Please advise. (Chuck LaTrace, Brasher Falls, NY)

A. While it is possible for an FCC car to hear the oscillator in your scanner from that distance, there would be no way for the observer to know whether he is hearing the oscillator of a TV, VCR, scanner, FM radio, TVRO converter, computer, intrusion alarm, or any other RF device.

Q. Is there available commercially an antenna tuner strictly for the AM broadcast band with at least three taps on the coil? (Bob Frediani, Princeton, NJ)

A. No. All commercial tuners and preselectors now on the market are designed for general coverage (usually 100 kHz-30 MHz) and therefore have little overlap due to the inordinately large number of total taps which would be required for the whole range.

I'm afraid you are going to have to build one yourself and, sadly to report, parts for homebrew tuners are getting extremely scarce. Your best bet is to attend the closest hamfest and pick parts up in the flea market.

Q. Could you do a review of the new Ten Tec RX325 receiver? (Steve Kidd, San Francisco, CA)

A. We definitely will be. The reason that you haven't seen one yet is that Ten Tec wisely sent out pre-production prototypes to experts in the field for comments and suggestions. These have now been incorporated into the receiver which is on the assembly line at this writing.

Q. 1. How can you tell when you are listening to intermod or the true frequency?

2. Can you use a preamp and a notch filter on a BC 250 and a Regency K-100? (Jim Cavanagh, Palatine, IL)

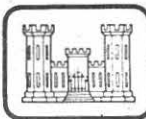
A. 1) Intermod may be recognized several ways on a scanner; usually, it is the same signal heard on more than one frequency (mobile telephone tones outside of the 152.5-152.8 MHz range, for instance). Often, you will hear two signals intermixed.

Intermod generally disappears when you take some remedy to reduce all signal levels slightly (a few dB), like switching to an indoor antenna.

Images, on the other hand, will always be exactly twice the IF frequency higher or lower than the actual signal (it is an image that you hear from aircraft when encountered in the police and fire frequencies).

Images will always be heard on multiple frequencies aside from their true frequency and most intermod signals are generated by very strong transmitters (FM and TV broadcasters, local mobile telephone and so on).

2) Yes, you certainly can use a preamp and notch filter simultaneously on your scanners. You would put the notch filter first (the antenna goes into the notch filter) then the preamp into your scanners. That way, strong signals are notched out before they get to the preamplifier.



United States Army Corps of Engineers

... Serving the Army
... Serving the Nation

Monitoring the U.S. Army Corps of Engineers

by Ed Soomre

The U.S. Army Corps of Engineers was founded on June 16, 1775. The USACE is headed by the Chief of Engineers, under the direction and supervision of the Secretary of the Army. The USACE is responsible for the following tasks:

- 0 Investigation, development and maintenance of the nation's water and related land resources.
- 0 Construction and operation of navigation projects
- 0 Flood control and major drainage projects
- 0 Shore and beach restoration and protection
- 0 Hurricane flood protection
- 0 Hydroelectric power production
- 0 Water supply and water quality control
- 0 Fish and wildlife conservation and enhancement
- 0 Outdoor recreation
- 0 Administer laws for the protection and preservation of navigable waters as well as emergency flood control and shore protection.
- 0 Support emergency relief activities that are directed by other agencies

The Corps is divided into eleven divisions which are subdivided into a total of 36 districts nationwide. The decentralized nature of the USACE insures a quick response and assistance to any area.

With such a large responsibility, a large communications network is needed. USACE communications range from high frequency to microwave. Many systems use a combination of various frequencies in many bands to complete their system.

HF Radio

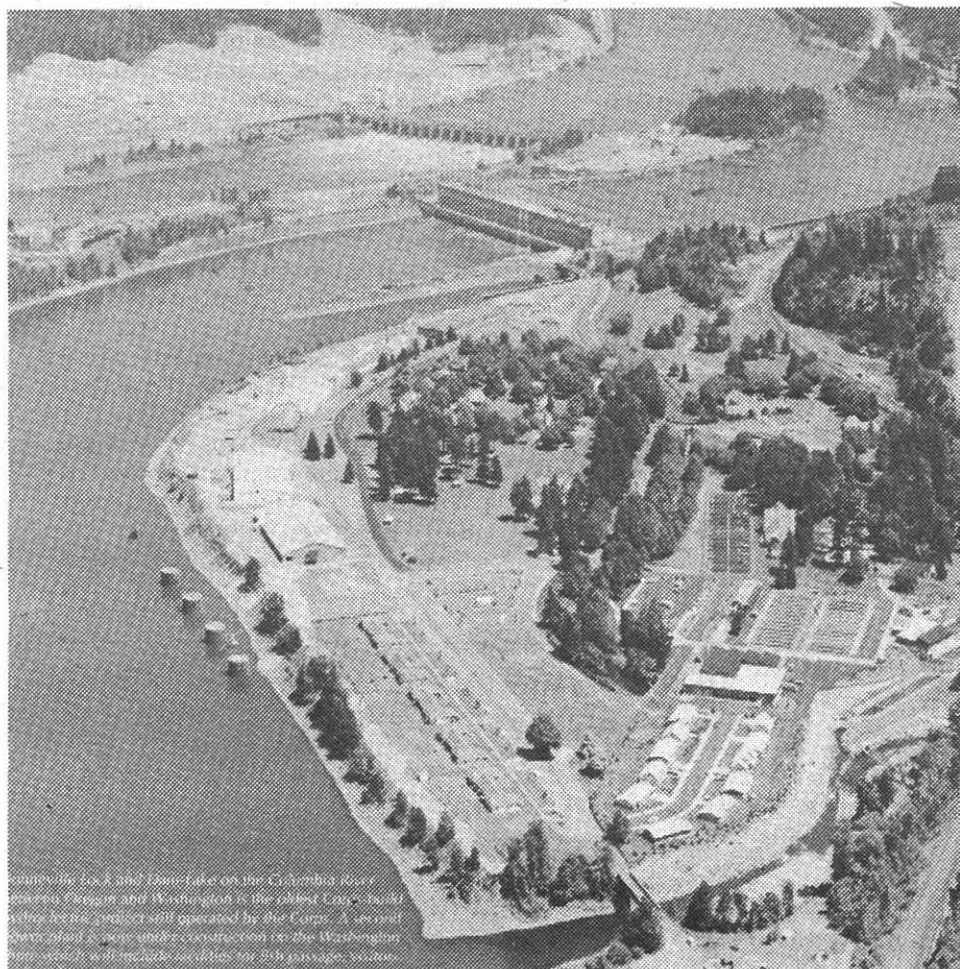
The high frequency (HF) single side-band (SSB) radio voice communications network is used primarily for long or short distance communications between divisions and/or districts. Best listening times are between 1100-1500 UTC. Stations send information such as hydrological data and operating instructions.

The following frequencies (in kHz) are used, with the most active ones having an * after them:

2064	2300	2326	2345	2348.5*
2350	2602	2605	3287	3290
3302	3305	4850	5011*	5015*
5327*	5346*	5400*	5437	

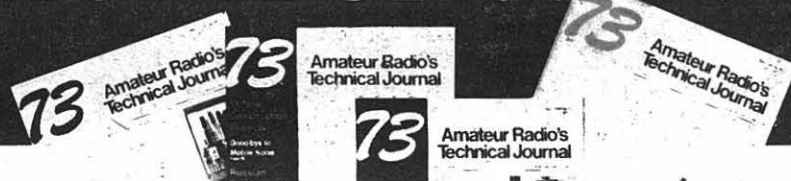
VHF Radio

The VHF radio communications



Bonneville Lock and Dam on the Columbia River between Oregon and Washington is the oldest Corps-built hydroelectric project still operated by the Corps.

MONITOR . . .



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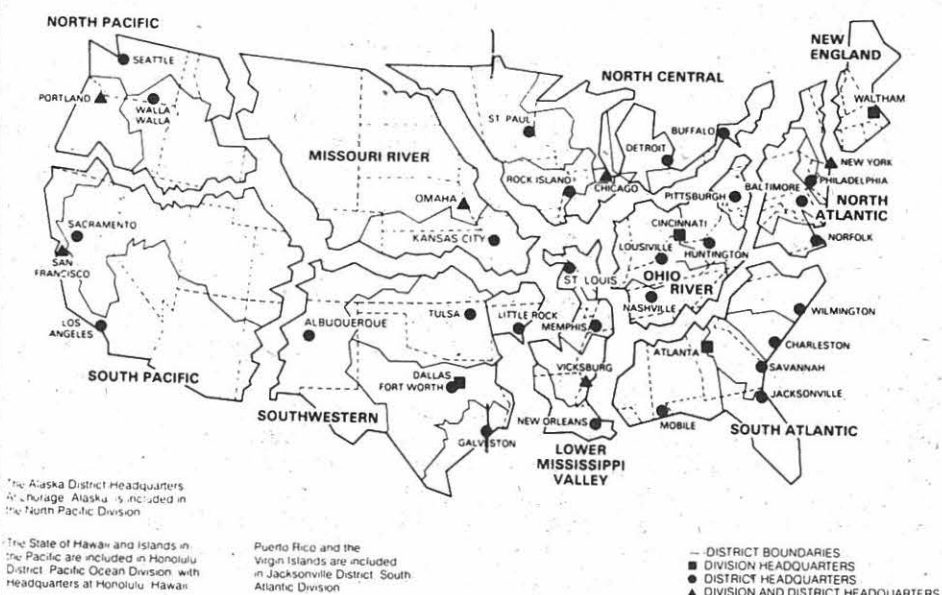
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736RMT

73: *Amateur Radio's Technical Journal*, PO Box 931, Farmingdale NY 11737

Civil Works Divisions and Districts



(Corps of Engineers, cont'd)

system is the primary mode of communications between stations within divisions and their mobile units. Communications are in the FM mode, with both repeater and simplex operations. Limited voice communications take place in the VHF low band in the 38 MHz region. These are stations in Illinois and Louisiana as well as Missouri.

Most voice communications take place in the VHF high band region of 162-168 MHz, both repeater and simplex operations, nationwide. These communications are used between district or division headquarters and stations in a certain geographical area.

Stations report hydrological data (water levels, rainfall amounts, temperatures, sky conditions) and instructions for dam operations (gate opening parameters, for instance) daily to the district or division headquarters.

The district or division headquarters records this information which is fed into a computer. Then the computer determines the next set of instructions for the dam operations, which is relayed back to the station.

Dependent upon weather conditions, many daily communications can take place between the district or division offices and the station.

As stated earlier, most of these systems use a repeater, although

USACE FREQUENCY LIST

The following list shows a general plan of frequencies by state of U.S. Army Corps of Engineers communications. They are voice FM transmissions that the listener is most likely to hear. All frequencies are in MHz.

38.39	LA								
38.69	IL	LA	MO						
38.89	MO								
38.91	MO								
162.350	MO								
162.8125	MI								
163.000	FL	GA	ID	IN	KY	LA	MI	NC	NJ
	NY	OH	PA	SC	VT	WA			
163.125	CT	MA	NH						
163.4125	AK	AL	AK	AZ	CA	CO	FL	GA	IA
	ID	IL	IN	KY	LA	MA	MD	MI	MN
	MO	MS	MT	NC	NB	ND	NJ	NM	NY
	OH	OK	OR	PA	SC	SD	TN	TX	UT
	VA	WA	WI	WV					
163.4375	AK	AL	AR	AZ	CA	CO	CT	DC	DE
	FL	GA	HI	IA	ID	IL	KS	KY	LA
	MA	MD	MI	MO	MS	NC	NE	NH	NJ
	NM	OH	OK	OR	PA	SC	TN	TX	VA
	VT	WA	WI	WV					
163.4750	CA								
163.5125	IL	KY	OH						
163.5375	AK	AL	AZ	CA	CO	FL	GA	ID	IL
	IN	KS	KY	LA	MI	MO	NJ	NM	NY
	OH	OK	PA	SC	TX	VA	WA		
163.5625	AK	AL	CA	CO	FL	GA	IL	KS	KY
	MO	MT	NY	OK	SD	TX	WA		
163.5875	CO	GA	PA						
164.050	KY	OH	TX	VA	WA				
164.175	MI	OR							
164.200	AK	AL	CA	FL	GA	IL	KS	MI	MO
	OR	NM	SC	WA					
164.500	MN	OR	TN	WI					
164.775	CA								
165.0375	OR								
165.7125	TX								
168.125	CT	MA	VT						
168.225	CA								
168.325	MA	NH							

Call Signs

WUA	New England
WUB	North Atlantic
WUC	South Atlantic
WUD	North Central
WUE 3/4	Pittsburgh/Huntington
WUE5	Louisville/Ohio River
WUE6	Nashville
WUG	Lower Mississippi River Valley
WUH	Missouri River
WUI	Southwest
WUJ	Northwest/Alaska
WUK	California



"let us Strive"

U.S. Corps of Engineers CAPE COD CANAL



Administrative building (above) and traffic control room from which all traffic is monitored and directed. The network is one of the most sophisticated navigational aids in existence, utilizing radar, closed circuit television surveillance, and multi-channel VHF-FM radio communications for the 17.4 mile long Canal.

there are also communications between stations as well as mobile units in vehicles (park supervisors, maintenance personnel, rangers, radio technicians and dam operators). The repeater output frequency can also be used in a simplex mode as a "repeater talk around" channel.

Another voice communications system in the 162-166 MHz band involves the maintenance and operation of navigable rivers, canals and harbors, while in the 156-157 MHz VHF marine band the USACE has communication with ships that are passing through the area. This involves mariner safety information,

weather reports, opening and closing of bridge or canal operations, and any other communications pertaining to operation in that area.

Non-voice data communications are used in these systems, too, mostly for automatic rain gauge measuring systems. Each gauge has a radio transmitter that sends measurement data back to USACE division or district headquarters. This is usually done by transmission of data from each rain gauge to a main receiving station (which can be at the voice radio repeater site) and forwarded back to the division or district headquarters.

Satellites

Another system involves the use of GOES (Geostationary Operational Environment Satellite) to relay this data from reporting stations to the district or division headquarters. Each reporting station has a processor/transmitter unit, sensors, sensor interfaces, a power source, and a transmitting antenna.

Ground based rain gauge systems use the 169-172 MHz or 406-420 MHz bands. The GOES system uses the following frequencies (not all verified):

GOES-2 136.380 (central USA)
1691.0
GOES-3 136.380 (western USA)
137.190
1687.1
1691.0
GOES-4 not operational
GOES-5 1691.0 (eastern USA)
1687.1

Control Links

Communications in the 406-414 MHz range are primarily control links used to connect VHF repeater sites with each other and/or district or division offices. A few of these control links are also located in the 148-150 and 162-168 MHz band. The control links use point to point communications, from one site directly to another.

There are two types of control links: an uplink that goes from the district or division headquarters to the VHF repeater site (the listener will only hear communications from the headquarters offices) and a downlink, where the listener will hear all communications from the repeater site to the district or division offices.

The same communications are heard over the VHF repeater output (except for the communications from the district or division headquarters received on the uplink). These are primarily communications from the stations in the network. These control links are highly directional and will be heard by listeners in the path of its signal or nearby. Some of these control links also relay data communications.

Other USACE communications in the microwave region (900 MHz and above) are used as control links and for point to point communications for voice and data. Many are multiplexed, where more than one transmission can be sent at a time. This is because the microwave links have many channels within their bandwidth. Data and voice can also be sent separately.

It is beyond the scope of this article to discuss the characteristics of these microwave signals and scanner receivers cannot tune them anyway.

RTTY/FAX

Radioteletype and facsimile are two specialized modes of communication encountered by utilities monitors of the shortwave spectrum. They are less frequently heard at VHF and UHF although they are quite prevalent on satellite links.

This month Bill Grant of Worcester, Massachusetts, shares with fellow MT readers a list of U.S. facsimile transmissions he has recently logged in the HF spectrum. Frequencies

shown are in kilohertz, types are weather or newsphoto; other column headers are scans per minute (SPM), index of cooperation (IOC--length to width ratio), and mode (upper or lower sideband).

We invite those readers interested in facsimile and radioteletype to share information with us; let us know if you would like to see these topics on a regular basis.

WANTED: RTTY/FAX Columnist

We frequently receive inquiries from serious utilities buffs as to the availability of more information on radioteletype and facsimile; sadly, input from this area is notoriously spotty.

We would like to hear from any of our readers who would like to tackle an article or even a column on either--or both--subjects.

LISTING OF RADIOFACSIMILE STATIONS---Prepared by Bill Grant(Worcester, Ma)

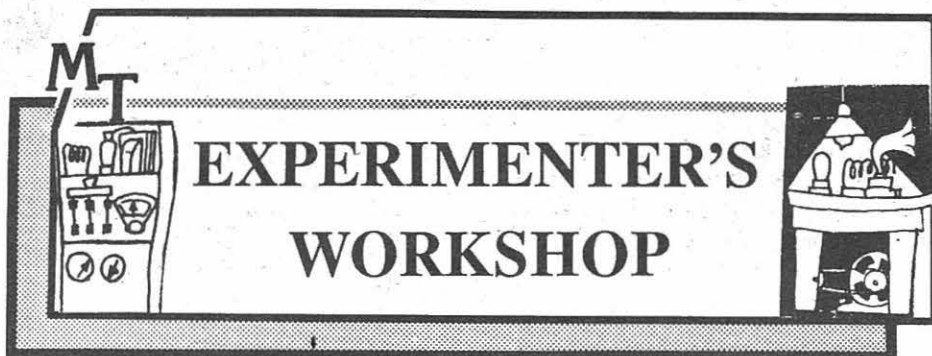
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Page 5

Report: Country List

July 1986

GEOGRAPHIC LOCATION	FREQUENCY	TYPE/SPM/IOC/LSB-USB	LOGGED(GMT)	REMARKS
U.S.A.(BOSTON, MA)	3242.5	WX/120/576/USB	0530	NMF/U.S.C.G./SKED:0530-0615
U.S.A.(BOSTON, MA)	7530.0	WX/120/576/USB	1730	NMF/U.S.C.G./SKED:1730-1815
U.S.A.(BOSTON, MA)	8502.0	WX/120/576/USB	1600	NIK/U.S.C.G./SKED:1600(MAR-JUL)
U.S.A.(BOSTON, MA)	12750.0	WX/120/576/USB	1600	NIK/U.S.C.G./SKED:1600(MAR-JUL)
U.S.A.(BRENTWOOD, NY)	9290.0	WX/120/576/USB	0712-1212	WFA/SKED:0712-1212
U.S.A.(BRENTWOOD, NY)	9389.5	WX/120/576/USB	0712-1212	WFH/SKED:0712-1212
U.S.A.(BRENTWOOD, NY)	11035.0	WX/120/576/USB	0712-1212	WFL/SKED:0712-1212
U.S.A.(BRENTWOOD, NY)	17436.5	WX/120/576/USB	1950-2350	WFK/SKED:1950-2350
U.S.A.(HONOLULU, HI)	5037.5	WX/120/576/USB	----	KM70
U.S.A.(HONOLULU, HI)	7770.0	WX/120/576/USB	----	KM70
U.S.A.(HONOLULU, HI)	9984.0	WX/120/576/USB	1230	KM70/SKED:24 HOURS
U.S.A.(HONOLULU, HI)	11090.0	WX/120/576/LSB	1145	KM70/SKED:24 HOURS
U.S.A.(HONOLULU, HI)	13627.5	WX/120/576/USB	----	KM70
U.S.A.(HONOLULU, HI)	16135.0	WX/120/576/USB	0045	KM70/SKED:24 HOURS
U.S.A.(HONOLULU, HI)	23331.5	WX/120/576/LSB	0030	KM70
U.S.A.(KODIAK, AK)	4298.0	WX/120/576/USB	----	NOJ/U.S.C.G./SKED:04,10,16,22,23
U.S.A.(KODIAK, AK)	8459.0	WX/120/576/USB	0400	NOJ/U.S.C.G./SKED:04,10,16,22&23
U.S.A.(LA JOLLA, CA)	8646.0	WX/120/576/USB	1700	WJD/SKED:1700-1800,2300-0100
U.S.A.(LA JOLLA, CA)	17410.5	WX/120/576/USB	1700/2330	WJD/SKED:1700-1800,2300-0100
U.S.A.(MOBILE, AL)	6852.0	WX/120/576/USB	1800/2000	WLO/NOAA'S OCEAN SERVICE CENTER
U.S.A.(MOBILE, AL)	9157.5	WX/120/576/USB	1800/2000	WLO/NOAA'S OCEAN SERVICE CENTER
U.S.A.(MOBILE, AL)	11145.0	WX/120/576/USB	1500/1800	WLO/NOAA'S OCEAN SERVICE CENTER
U.S.A.(NEW YORK, NY)#1	10340.5	PHOTO/60/288/LSB	EVENINGS	WFK/AP/ENGLISH TITLES
U.S.A.(NEW YORK, NY)#1	15824.0	PHOTO/60/288/LSB	DAYS	WFL/AP/ENGLISH TITLES
U.S.A.(NEW YORK, NY)#1	19850.5	PHOTO/60/288/LSB	DAYS	WFK/AP/ENGLISH TITLES
U.S.A.(NEW YORK, NY)#1	23075.0	PHOTO/60/288/LSB	DAYS	WFM/AP/ENGLISH TITLES
U.S.A.(NEW YORK, NY)#2	11461.0	PHOTO/60/288/LSB	DAYS	WFK/UPI/ENGLISH TITLES
U.S.A.(NEW YORK, NY)#2	15785.0	PHOTO/60/288/LSB	DAYS	WFM/UPI/ENGLISH TITLES
U.S.A.(NEW YORK, NY)#2	18509.0	PHOTO/60/288/LSB	DAYS	WFK/UPI/ENGLISH TITLES
U.S.A.(NEW YORK, NY)#2	20799.0	PHOTO/60/288/LSB	DAYS	WFM/UPI/ENGLISH TITLES
U.S.A.(NEW YORK, NY)#2	22925.0	PHOTO/60/288/LSB	INACTIVE	WFM/UPI/ENGLISH TITLES
U.S.A.(NORFOLK, VA)	3189.0	WX/120/576/USB	INACTIVE	NAM/U.S. NAVY/NFAX
U.S.A.(NORFOLK, VA)	3357.0	WX/120/576/USB	NIGHTS	NAM/U.S. NAVY/NFAX/SKED:0000-1800
U.S.A.(NORFOLK, VA)	4975.0	WX/120/576/USB	INACTIVE	NAM/U.S. NAVY/NFAX
U.S.A.(NORFOLK, VA)	8080.0	WX/120/576/USB	CONTINUOUS	NAM/U.S. NAVY/NFAX/SKED:24 HOURS
U.S.A.(NORFOLK, VA)	10865.0	WX/120/576/USB	DAYS	NAM/U.S. NAVY/NFAX/SKED:24 HOURS
U.S.A.(NORFOLK, VA)	16410.0	WX/120/576/USB	DAYS	NAM/U.S. NAVY/NFAX/SKED:1200-0000
U.S.A.(NORFOLK, VA)	20015.0	WX/120/576/USB	AFTERNOONS	NAM/U.S. NAVY/NFAX/SKED:1800-0000
U.S.A.(PEARL HARBOR, HI)	2122.0	WX/120/576/USB	1130	NPM/U.S. NAVY/FFAX/SKED:0600-1600
U.S.A.(PEARL HARBOR, HI)	4853.5	WX/120/576/LSB	0530/1245	NPM/U.S. NAVY/FFAX/SKED:24 HOURS
U.S.A.(PEARL HARBOR, HI)	9336.0	WX/120/576/LSB	INACTIVE	NPM/U.S. NAVY/FFAX
U.S.A.(PEARL HARBOR, HI)	9394.0	WX/120/576/LSB	0300/1200	NPM/U.S. NAVY/FFAX/SKED:24 HOURS
U.S.A.(PEARL HARBOR, HI)	14824.0	WX/120/576/LSB	0100	NPM/U.S. NAVY/FFAX/SKED:24 HOURS
U.S.A.(PEARL HARBOR, HI)	16398.0	WX/120-240/576/USB	INACTIVE	NPM/U.S. NAVY/FFAX
U.S.A.(PEARL HARBOR, HI)	21835.0	WX/120/576/LSB	0000/2230	NPM/U.S. NAVY/FFAX/SKED:1700-0630
U.S.A.(SAN FRANCISCO, CA)	4346.0	WX/120/576/USB	0300	NMC/U.S.C.G.
U.S.A.(SAN FRANCISCO, CA)	8682.0	WX/120/576/USB	EVENINGS	NMC/U.S.C.G.
U.S.A.(SAN FRANCISCO, CA)	12730.0	WX/120/576/USB	AFTERNOONS	NMC/U.S.C.G.
U.S.A.(SAN FRANCISCO, CA)	13115.1	WX/120/576/USB	1730	NMC/U.S.C.G.
U.S.A.(SAN FRANCISCO, CA)	17151.2	WX/120/576/USB	1730	NMC/U.S.C.G.



Build this 1.8-30 MHz broadband antenna for transmitting or receiving -

A Wider Windom

by Bob Grove WA4PYQ

Many stalwart experimenters still write for information about an all-band dipole which Bob Grove designed--and still uses--for continuous shortwave coverage, transmitting and receiving, without the use of a tuner.

The following article, originally appearing in *73 Magazine*, September 1980, has been updated for publication here.

A half century ago, Loren Windom W8GZ started experimenting with an off-centered dipole which would catch the fancy of generations of hams.

The principle was simple: While a centerfed dipole exhibits a 75-ohm resonant response on its half-wave frequency and near that on the third harmonic, it is far from an allband antenna. Would it be possible to locate a feedpoint other than the center which would show a common impedance on several harmonically-related ham bands? Loren Windom decided to find out.

After considerable experimentation, he determined that a point 14% away from the center of the antenna (that is, 36% from the end) exhibited a nearly identical feedpoint impedance on even multiples of the half-wave frequency. RF signals at 3.5, 7, 14, 21 and 28 MHz would see an impedance of approximately 400 ohms under ideal free-space conditions. Early amateurs used single-wire feed, approximating the correct feedpoint impedance. Later, 300-ohm open-wire line was used, as was TV twinlead.

But, as many amateurs have found out, antennas cut for the CW portion of the bands begin to balk in the higher portions of the phone bands.

With these limitations in mind, I decided to see if the off-centered antenna could be reconfigured to accommodate phone operation without the use of an external tuner.

First Trials

Dozens of individual experiments were devised, each involving a gradual change in feedpoint, feedline length, total dipole length, and individual lengths of each dipole leg.

Results were frustrating. When one band would represent a 1:1 SWR, another would show a zillion to one! The problem was not so severe on 75 and 40 meters because subtle dimensional changes were not so critical, but at 20 meters and above the roof came in!

Initial trials were done with a 4:1 balun transformer connected directly at the antenna feedpoint. I then remembered a comment published somewhere that it is often better to isolate the balun with a length of balanced line first. The literature reported that a length of 44 feet, or multiples thereof, seemed to be ideal.

I could not get that length to work. Nor did I find a harmonically-related 67-foot length to be of advantage. But at 48-1/2 feet of 300-ohm feedline, the antenna tamed down considerably. SWR readings were reasonable on all bands, and with some judicious pruning of antenna length, the SWR was reduced even further.

The magical combination, at least at my location, with the antenna elevated about 25 feet above ground, seems to be a 134-foot dipole divided into 90- and 44-foot sections. This combination results in a feedpoint 17% off center (33% from one end).

The balun transformer which we used was the world-famous W2AU, marketed by Unadilla (Microwave Filter Company, 6743 Kinne Street, East Syracuse, NY 13057). A similar unit is made by Palomar Engineers (Box 455, Escondido, CA 92025). Both are carried by many amateur radio supply houses.

Ferrite-core balun transformers typically perform uniformly from 3-40 MHz, but reception from 100 kHz to 50 MHz was phenomenal!

It is recommended that the experimenter who intends to put up one of these modified Windoms should start with measurements slightly long and prune the antenna down to proper performance. Begin with a 49-foot feedline, 93 feet of wire for the long end of the antenna, and 46 feet for the short end.

Three strain insulators will be needed, one for the middle and one on each end. Galvanized, stranded-steel guy wire is probably the best all-around antenna wire for this purpose. It is strong, corrosion resistant, inexpensive, and easily soldered. It is readily available at most hardware stores.

After passing the antenna wire through the end insulators, wrap it lightly around itself so that it can easily be changed in length for tests.

For feedline, use a 50-foot length of outdoor 300-ohm TV twinlead to start with. It may be trimmed if juggling the antenna length does not bring the SWR down to a satisfactory level.

For the run to the shack, 75-ohm coaxial cable is recommended. Unless transmit power is to exceed 300 watts, RG-59/U will work just fine. If you have a length of RG-6/U cable-TV coax, it will work just as well. Its slightly larger diameter may require some vinyl jacket shaving at the ends to accommodate a conventional adapter sleeve for the PL-259 connectors.

Erecting the Antenna

I found the easiest way to erect the antenna was to tie a rock to the end of a roll of nylon twine, unwind thirty feet or so, and heave it over an upper limb of a tree. The twine is cut from the roll and tied to an end insulator. It is easily hoisted over the branches. The process is repeated at another tree at the far end of the antenna.

Such an arrangement makes it easy to lower and raise the antenna dur-

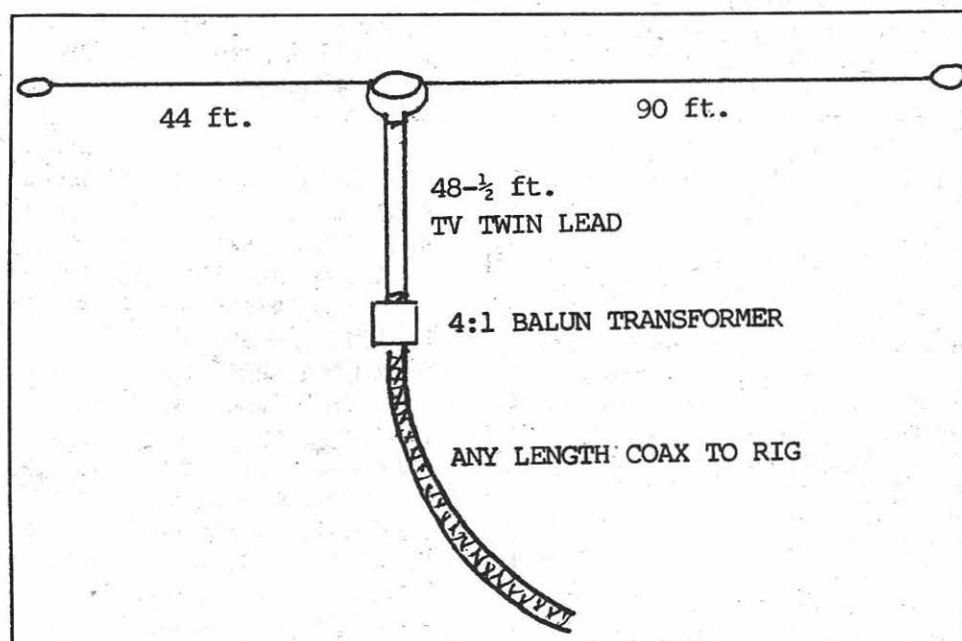
ing tuning procedures, as well as provides access to the antenna for repair or severe weather protection. The lower end of the twine may be tied to an inconspicuous nail driven into the tree trunk.

A typical chart of SWR versus frequency for one off-centered antenna, which I personally use, is shown below. The antenna is 134 feet in total length, fed at a point which divides it into 90- and 44-foot lengths by a 48-1/2 foot length of heavy-duty outdoor, 300-ohm TV twinlead. A Unadilla 4:1 balun transformer connects the twinlead to a random length of RG-6/U, 75-ohm TV coax to the shack.

Freq MHz	SWR
1.8	2.0
3.5	1.3
3.6	1.4
3.7	1.3
3.8	1.3
3.9	1.4
4.0	1.3
7.0	1.5
7.1	1.3
7.2	1.1
7.3	1.1
14.0	2.7
14.25	2.4
14.35	2.0
21.0	3.5
21.25	1.8
21.45	1.2
38.0	3.0
28.5	1.8
29.0	2.5
29.5	1.9

Signal reports have been outstanding. Even with less than 100 watts input to the rig, it was hard to call CQ without receiving a reply, often from several stations, commenting on the strength of the signal.

Carefully pruned, the phone man's Windom antenna is an inexpensive way for any ham to get top performance on all HF bands without having to resort to a transmatch.



SAMPLE LETTER

Senator _____
_____ Office Building
Washington, DC 20510

Dear Senator _____:

I am writing to vigorously protest the passage of an unenforceable law, Senate Bill 2575, the Electronic Communications Privacy Act of 1986. As written, substantive portions of the bill are illogical; worse, they reflect considerable ignorance of the laws of physics and the realities of the consumer marketplace.

The mobile telephone industry has convinced Congress, and is now working on the Senate, that cellular mobile telephone calls are inherently private. They are not. As with other forms of mobile radio they are--and always have been--readily accessible to casual monitoring with widely manufactured consumer entertainment radios and even television sets.

In an apparent effort to boost a lagging marketing program, the cellular telephone industry's powerful Washington lobby is obviously attempting to legislate legitimacy to the invalid claim that cellular mobile telephones are inherently private.

At the present time there are, according to independent estimates, some 7 million scanners and 19 million shortwave radios capable of receiving frequencies which would be outlawed by the pending legislation. Many of these frequencies are assigned on a shared bases.

Clearly, it is not only impossible to avoid encountering them, it is necessary in order to determine their sources in cases of interference, frequency studies for license applications, and other legitimate needs of access to a public resource.

All other users of the radio spectrum are made aware that, by its very nature of penetration of private dwellings, radio signals may be monitored by anyone who wishes to tune them in. Only the mobile telephone industry

expects a law to be granted in their interest to forbid Americans from fully utilizing pre-existing radio and television equipment manufactured under present law and purchased by them in good faith.

Inexpensive devices exist which can be added to any communications equipment to encrypt their contents, making casual interception impossible. The mobile telephone industry is well aware of this, but would sooner have the burden of non-interception placed on the American public rather than pay the minor up-front cost of adequately designing their own equipment.

Adequate law presently exists prohibiting the intrusion of uninvited listeners into private communications and the subsequent use of the information so obtained (1934 Communications Act, section 705); superseding this workable regulation with a bad law that is totally unenforceable and illogical in its basic tenets makes a mockery of the judicial system.

In conclusion, I am in favor of protecting the right to privacy of the individual when such a right has a reasonable expectation. I am opposed to any legislation motivated entirely by corporate profit and which, by its self-serving interest, is unreasonable and unenforceable.

Please consider the testimony of so many well-informed individuals to bring correct perspective to the hearings on this subject in spite of the highly-financed special interests' attempts to obscure the facts.

Sincerely,

Robert B. Grove,
Publisher, Monitoring Times;
President, Grove Enterprises

YOUR SENATORS AND THEIR ADDRESSES

Hart = Hart Senate Office Building
Dirksen = Dirksen Senate Office Building
Russell = Russell Senate Office Building

(Please turn to next page)



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Mailbag

Shortwave

Larry Miller, MT Broadcast Editor, P.O. Box 691, Thorndale, PA 19372

As we head into the fall DX season, there are glimmers of hope that conditions on the shortwave bands are indeed improving. One recent night I was scanning the bands when out popped one of the clearest, strongest signals I've encountered in months. Radio Moscow? Deutsche Welle? No, it was the usually very unreliable Radio Polonia from Warsaw on 7145 kHz at 0200 UTC. Other frequencies announced by the station for the 0200 broadcast include 6095, 6135, 7145, 7270, 9525, 11815 and 15120 kHz. Unfortunately, only 7270 was even remotely audible.

Granted that Poland is not one of the greatest DX catches in the world, but the fact that, at least for a time, it could be heard with such a strong, crystal clear signal is encouraging. Of course, it's once again dropped off into static land, but at least it provides hope that things are improving.

Steve Forest of Cincinnati, Ohio checks in to say that he concurs with our assessment of improving conditions. Says Steve, "Several stations have recently been sending signals this way, which show a marked improvement in quality. Radio Austria International is one. 9770 kHz is coming in beautifully at 0130 in English. And Radio Japan -- yes, Radio Japan -- blares in at 2300 UTC on 9645 kHz. It sounds so good, in fact, that I've got to believe that there's a transmitter trade somewhere. Is it true?"

Yes, Steve, Japan transmits over the facilities of Africa Numero Un in Gabon. That's why you're getting those booming signals. And, of course, soon we'll all have the chance to hear Japan via the transmitters of Radio Canada in Sackville, New Brunswick. Of course, you'll be hearing a lot less North American programming from Canada itself...

Ed Insinger of Summitt, New Jersey logged what truly is a great DX catch. But Ed's story is not so much about the logging -- though that's impressive enough -- as it is the fact that he finally wheedled a QSL card out of the station. Back on November 8, 1983, Ed caught the Voice of Peace on 6240 kHz -- reportedly broadcasting with a puny 400 watts. "With headphones on my ears and pencil in my hand," says Ed, "I recorded every bit of information I could identify, amidst static bursts and a signal barely audible above the

noise level. I 'hung tough' from 2315 to 0035 UTC, at which time the signal became inaudible. There were definitely enough details to warrant a reception report so I began preparing one -- with the thought in mind that I had logged a super DX catch, one of those 'dream-come-true' loggings."

"I know it's been said before that the search for peace is difficult and elusive," continues Ed. "And a greater appreciation of the phrase was to take place over the next two years and eight months as I sent off a total of seven separate reception reports in an effort to get a QSL from the VOP."

"Now I can say that my patience and persistence paid off. I had my moments of doubt and disappointment, but in the end, happiness and success at last! I am now a happy and content owner of a bona fide Voice of Peace QSL card."

Ed, that's a tale that'd make even "Mr. QSL," Gerry Dexter, stand up and take note! Good going! So you see, miracles do happen. And since we're telling QSL tales, here's another designed to inspire and encourage QSL collectors around the world.

In a recent issue of ADXR, Hank Holbrook of Maryland reports receiving a QSL card from the Dutch guided missile frigate, *De Ruyter*. Along with the QSL, came a note from the ship: "A week ago I found your card or QSL of date July 8, 1981 in some old books. I know it's a long time ago, but I'll send you our reply." Total time from reception to QSL card: 1,695 days!

Patience -- and a bit of luck -- are apparently all key ingredients to this fascinating aspect of radio monitoring.

Steve Forst of Clifton Heights, Pennsylvania writes to say that he got his "new and improved" *Monitoring Times*. "A quick thumb-through showed some of the usual MT fare," says Steve, "Like 'Eavesdropping on the Afghan Army,' 'Tuning in Yukon Lumber Camps' and 'Scanner Frequencies for Mt. Rushmore Facelift.' Then I saw it! A mirage? No! *Shortwave!* Wonderful!"

Concluding, Steve says: "I hope you had fun at the ANARC convention. I was planning to attend and buy everyone a beer but I had electroshock treatments scheduled

for that Friday."

Raymond Morales of Bronx, New York says he was scanning the World Radio News column in the July issue when "I came across this gem: [Radio Moscow's Vladimir] Posner will now be heard regularly on Radio Moscow... reporting from the Siberian bureau.' That's gallows humor if I ever read it!"

"What happened to Larry Miller on *Radio Canada International's Shortwave Listener's Digest Forum* program?" asks Bill Meise of Iowa City, Iowa. "Have you been replaced for breaking the story about RCI's cancellation of their North America service?" I don't think so, Bill. I think what happened was that I declined to participate in that series of three programs because they were technically-oriented programs and frankly, I'm just not that into resistors and diodes and such. As for breaking the story about RCI's cancellation of the North American service, I don't think that'll affect our relationship. I'm just a journalist doing my job and I'm sure that they recognize that.

"Do you really consider the stations in last month's article 'semi-tough' to be only 'semi-tough'?" My God, man," writes Martin Smith of Clearwater, Florida, "that article should have been called simply 'tough.'" Wait until you read next month's article on the really tough ones! And we best make a disclaimer here: *Monitoring Times* won't be responsible for anyone who pulls out their hair trying for those stations. They are tough!

One final item: *International Radio* subscribers have probably noticed that the advanced program details have been missing from the magazine in the past few months. It's the only feature that didn't make the transition when *International Radio* merged with *Monitoring Times*. The reason for this is that because *MT* is a significantly larger publication, it goes to press earlier than *IR* did. As a result, it's more difficult to get such dated material as Advanced Program Details into the magazine -- the stations simply don't plan that far in advance.

What I'd like to know is this -- do you want this section to return? And are you willing to sacrifice seven to ten pages of articles and other information in order to get it back? The decision is yours. We'll tally the responses and make a decision within the next month or so. Write me and let me know what you think.

That wraps up another edition of Mailbag. Thanks to all who wrote. And as always, if you have any questions, comments or criticisms, feel free to drop me a note at P.O. Box 691, Thorndale, PA 19372.

Mailbag

Utilities

Bob Grove, Utilities Editor, P.O. Box 98, Brasstown, NC 28902

SPECIAL COMPLIMENTS

I recently saw your July issue of *MT* with its new format. It looked really fine and you and your entire staff are to be congratulated. Best of luck!
Tom Kneitel, Editor
Popular Communications

Congratulations on the premiere issue of the new Monitoring Times. I was happy to see the Ham Radio column and credit to the ARRL Letter.

I wish you and Larry Miller good luck on your joint venture
Paul L. Rinaldo, W4RI
Publications Manager
American Radio Relay League

I enjoyed very much reading the *Monitoring Times* and I am surprised at the great amount of information it contains. Since I am not too conversant in technical matters, I find many of your articles more helpful to me than those in the ham magazines because they are simply and clearly written.

Rev. Michael Mullen, C.M.
Pres., International Mission
Radio Association (IMRA)

The new Monitoring Times looks great. I had been a subscriber to International Radio since I'm primarily a SWBC listener, but my interests recently changed or rather expanded and the new combined issues are a great buy!

Don Hosmer
Business Mgr/Editor
Michigan Area Radio
Enthusiasts

"SEEKER" POSTSCRIPT

The article on "SEEKER" (Aug '86, p.27) has already prompted several requests for information within a week of my receiving my issue. If anyone does ask, the pictures for Figures 2 and 3 got swapped and the description for Figure 3 should have been "International Broadcaster Control Menu."

"SEEKER" was officially unveiled at ANARCON '86 in Montreal (and) was one of the most talked about products in the convention display area. International broadcasters from five countries interviewed me about "SEEKER," but *Monitoring Times* scooped them all!

"SEEKER" is being priced at

\$179 (US) until 10/31/86. I thought your readers might appreciate this additional information.

Allan Franklin
AF Systems
P.O. Box 9145
Waukegan, IL 60079

COMMENTS AND SUGGESTIONS

I have just completed the modification to my Regency MX5000 that was in your article for the MX7000. It works great! Now I have a good scanning speed and I can hardly hear that annoying beep. "Helpful Hints" has doubled the value of my MX5000. Thanks again.

Tony Benfield
Goldsboro, NC

Congratulations on the new format and all of Monitoring Times--a great, friendly publication.

I think your new frequency section is fine...and never think about putting it in smaller type. Not all your subscribers are youngsters with keen, sharp eyesight.

Robert Gash
Berkeley, CA

New *MT* with Int'l Radio is great! Subscribers getting a lot of extra info and your merger is good news for the hobby.

Idea for article I'd like to see-- how to use IBM PC as monitor for RTTY.

Art Pike
Las Cruces, NM
Good suggestion, Art. How about it, writers?...Bob

How about an article sometime regarding the regenerative and super-regenerative family of receivers? Can't beat them for lack of birdies (although we can fault them for lack of selectivity). There must be a lot of readers out there who could get a kick out of this subject -- for history of listening, to say nothing of current uses. (The Radio Shack Science Fair Globe Patrol must be only one of hundreds of models.) Keep up the good work.

Lou Burkhardt
Los Alamos, NM

Great idea! I have always been a loyal fan of superregenerative receivers. Any of our budding experimenters want to favor us with an article?...Bob

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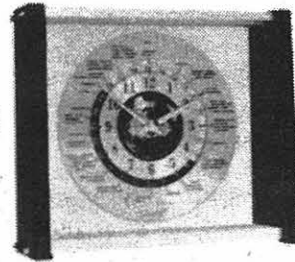


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For Sale: HEATH GR-64 receiver. Tunes 550 kHz to 30 MHz. No tubes. \$28.00 including shipping. Bill Smith, RFD 238W3, Locust Street, Douglas, Mass. 01516.

For Sale: Two BEARCAT 100 handheld programmable scanners with all attachments and accessories. Best offer. Call (617)523-4100 weekdays.

Seventeen ex-Govt. RCA VHF pagers 164.9625 MHz. Seventeen drop-in charger units for pager and spare 3.9V Ni-Cad. Thirty-one spare batteries (17 new). All functional when replaced April 1985. \$400.00 delivered (US). BC-348, COLLINS R-392, YAESU FRG-7 and other radios for sale. Write for list. MVSS, Box 73, Flaxville, MT 59222.

SURVEILLANCE RECEIVERS - CEI 901: 30-300 mhz, CEI 702: 235-1000 MHz, LTV G175F: 30-260 MHz, LTV G166J: 250-1000 MHz. AM/FM/CW. \$225 each, \$425 pair. **VOICE ENCRYPTION DEVICE** - Datotek DNV-630. Operates with most military transceivers. Cannot be intercepted. \$1,200 pair. **SEISMIC INTRUSION DETECTORS** -

"Florida Skip" Ceases Publication

On June 7, 1986, Andy Clark, W4IYT, publisher and editor of *Florida Skip*, suffered a stroke. A subsequent letter sent to advertisers and subscribers of his magazine explained that his doctor advised Andy to give up all stressful activity immediately.

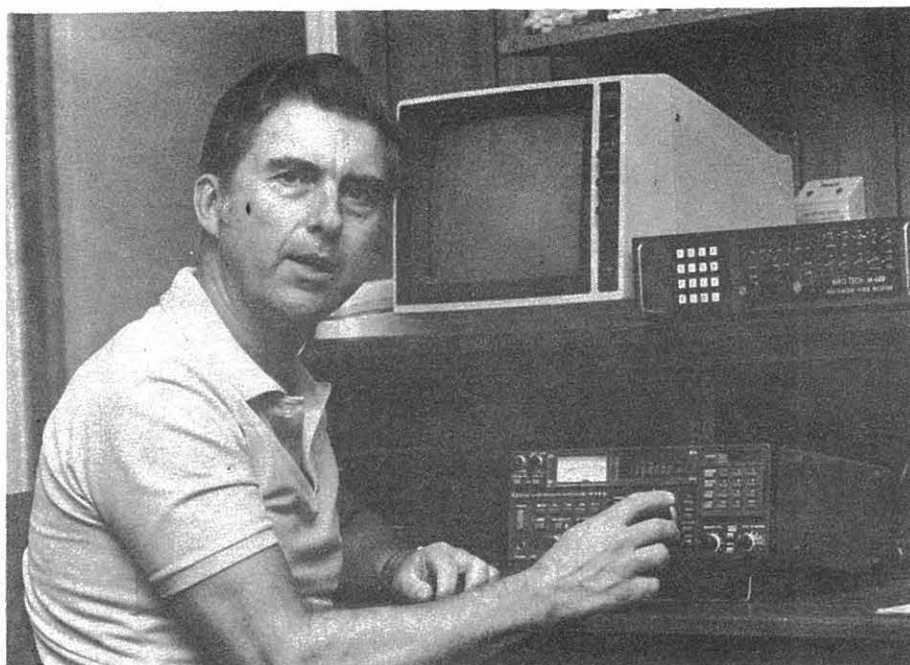
For the past 30 years Andy, with the help of his wife Betty, W4GGQ, had performed more than 90 percent of the work which went in to putting out the monthly publication.

Andy has been a persistent and admirable force in amateur radio in the state of Florida. We wish him a full recovery and will miss his fine publication.

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All stated specifications are approximate and subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. R71A1084